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We print this week a very interesting report by William J. Wilgus on a proposed freight subway to receive and distribute freight between the important wholesale districts on Manhattan island and all the railroads having connections at the port of New York, by means of a distributing ground on the Jersey meadows and tunnels under the river. The report deals so fully with the physical details that they need not be further enumerated here, but the project has other aspects besides the purely physical ones, and some of them are of very unusual interest. At first glance the commercial prospects of the enterprise do not look good. The Chicago freight subways, built through clay, have been none too successful, and the experience of all New York river tunnels, with a single possible exception, has been that final costs mounted much higher than original estimates. But important differences are presented between the Chicago project, the passenger tunnel projects and the freight tunnel project. A good many mistakes were made in Chicago for the benefit of posterity. The cars are too small, and the constant succession of grade crossings makes the traffic very slow. In addition to this the enterprise was handicapped greatly by its beginning, at a time when an honest, straightforward project could not be gotten through the Chicago City Council in an honest, straightforward manner. As regards the doubtful immediate profitableness of the under-river passenger tunnels, viewed as local carriers, and not as parts of a through system, it must be remembered that five cents is a very small rate of fare to charge for this service, but that it cannot well be increased, partly because of the ease with which ferry competition can be instituted, and partly because of municipal requirements. In contrast to this situation the tremendous terminal cost of freight at New York offers great inducements to new methods. The advantage which freight, per hundred pounds of bulk, has over passengers, per hundred pounds of bulk, in economical transportation on through lines is entirely lost and reversed when it comes to the terminal in a great city. The passenger handles himself with great celerity; the freight needs much handling and complicated mechanism to get it around, and its powers of obstruction are infinite. Mr. Wilgus is convinced that the solution lies in distributing the freight where land is cheap, in New Jersey, and that it can be delivered quickly and directly to the lower floors of warehouses a good deal more cheaply by the proposed freight tunnel system than by the present methods. He realizes fully that the kind of freight rates which are charged in the open country will not pay the fixed charges on these tunnels, and his plan is to ask the municipality openly and frankly for the right to make rates high enough to earn a fair return on actual construction costs. If this right cannot be secured definitely and conclusively, it is not proposed that the undertaking shall go further. Mr. Wilgus in effect says to the authorities: The whole tendency of present legislation is to prevent a public carrier from earning more than a fair rate on the capital he has actually spent. It is obvious that the theory of this legislation implies that a fair rate may be earned. Will you, therefore, give me permission to earn one? It is refreshing and unusual to see a great public enterprise undertaken in this way, and we wish it all success. That there is urgent need for the relief from ever-growing surface congestion needs no argument.

In our issue of October 2, page 1029, we sought to show that the rulings of the Interstate Commerce Commission regarding demurrage on private cars give an unfair advantage to shippers owning cars as compared with shippers not owning them. Robert J. Bailey, in a letter published in our issue of October 9, page 1090, replied by arguing that private cars are not profitable. This begs the question. The railroads pay mileage for the use of private cars and haul them with the same locomotives and upon the same rails as their own cars. They must charge consignees demurrage on railroad cars whether on railroad tracks, or on private tracks. We sought to show that if railroads are not permitted to charge demurrage on private cars on private tracks, all receivers having private tracks will have an inducement to buy from shippers owning cars rather than from shippers owning none. But Mr. Bailey asks: "What private car owner would willingly ship his product in his own car, knowing it would be held an indefinite period by one of his customers, when he could make shipments, perhaps prompt or otherwise, in a car owned by a railroad line?" Well, we think that almost any large coal mine operator in the section where Mr. Bailey does business would consent that his cars should be used as free storehouses for a considerable time if in that way he could get and hold business that otherwise would go to his small competitors that own no cars. Does not Mr. Bailey think so, too? And if in this way the large shipper gets business that otherwise would go to a smaller competitor, is not the small competitor as much hurt as he would be by similar discrimination in the use of railroad cars, and is not the spirit of the Interstate Commerce Law just as much violated? The law and the Interstate Commerce Commission should treat private cars that are hauled on railroad tracks by railroad locomotives just as it treats railroad cars. The law and the Commission do not let the railroad discriminate in the use of its plant in order to make a profit, and it would seem that by the same token they should not allow discrimination in the use of

instrumentalities of transportation that the railroad hires from others. If the private car cannot be made profitable without being made an instrument of unfair discrimination, it will fall a victim to that law of "survival of the fittest," under which Mr. Bailey seeks to condemn the non-car-owning shipper.

THE RAILWAY BUSINESS ASSOCIATION.

It is said that the name of this new organization sprang from the quick and fertile mind of Mr. Mulliken, of Chicago. However that may be, it was an inspiration.

The association is one of business men. In the enrolment there are no doctrinaires, no sentimentalists, no dilettantes. They are men loaded with the great practical responsibilities of earning dividends of real money and of paying real wages to concrete workingmen, and so far they have carried their loads with considerable success. Yet those business men are idealists, strange as it may sound. The fine notes of patriotism, of duty and of sympathy were often heard in their discussions.

Furthermore, these business men have banded themselves together for business purposes and especially to help to re-establish the business of the railroads and thus to better their own business.

But they recognize that their success will depend upon the dissemination of knowledge of facts and upon the creation of a correct public opinion. They are not in politics and have no political purpose. They are not combined to buy legislation or to influence courts. They are not combined to raise the prices of their own wares or to raise railroad rates. They have no schemes of coercion, or of boycott, or of improper influence in any direction. Their program is simply one of education, and their motive is enlightened selfishness.

This is all very fine, but how are these gentlemen going to carry out their beneficent program? Obviously they can command all the money that they need, but you cannot hand a man a dollar bill and say, "Here, be enlightened as to the real facts in political economy as applied to railroads!" That simple method of education is only applicable to the pupils in the horse-sheds on election day. The practical philanthropists who have started this new association will have to spend their money, with accurate knowledge of details, with imagination controlled and tempered by reason, and with power of organization. Their business history proves that these qualities are at their command and it seems reasonable to think that the only uncertainty as to the future of the enterprise lies in keeping up the interest of the members of the association after reviving business absorbs more and more of their time and mental energy. In other words, it is safe to assume that they know what they want to do, and that they know pretty well how they can do it, but when their factories get busy again and they are again making money, will not their interest in the new propaganda flag?

At any rate, the enterprise is a singularly interesting experiment in practical co-operation and probably it is destined to contribute much to the prosperity and happiness of the nation, and the gentlemen who have united in this project may count on the good will and the hearty co-operation of this journal.

LARGE CAPACITY ORE CARS.

Pittsburgh daily papers have reported that the Pressed Steel Car Company is building for the Carnegie Steel Company a number of ore cars having a capacity of 300,000 lbs. each, to be used in the heavy ore traffic between Pittsburgh and Lake Erie. The report had its origin in the fact that nine large ore transfer cars, having a capacity of 150 tons, had been built for local use at the furnaces. They are not intended for main line service or to be run at ordinary freight train speeds.

While it is doubtful if any considerable number of cars having a carrying capacity of 150 tons will be built and used in regular long distance traffic, it is interesting to note what some of the requirements for such cars would be. The wheel loads of 50-ton steel cars with four-wheel trucks are generally regarded as excessive, and should at least be taken as the maximum for the best track now in use. The eastern roads which have large numbers of these cars are concerned over the wear and the safety of the cast iron wheels under them, and the Pennsylvania Railroad is using forged and rolled steel wheels quite extensively for this kind of cars. The Union Pacific and the Southern Pacific are also using steel wheels under 50-ton steel cars on account of their greater safety under severe brake application on mountain grades.

One of the first requirements for cars of very great capacity which will therefore be taken for granted is the use of steel wheels, forged from the best grade of tire steel.

With a capacity three times that of the 50-ton car, and as no greater rail pressure should be imposed on our present tracks, the number of wheels required per car will be $8 \times 3 = 24$. These could be disposed of in six four-wheel trucks or four six-wheel trucks. The axles, journals, journal boxes and bearings would then be the present M. C. B. standard for 50-ton cars. The wheel space for six four-wheel trucks would be 51 ft. with flanges in contact; and the space required for air-brake cylinders, reservoirs and lever connections would increase the length of the underframe of the car to 60 ft. On such a long car a complicated construction would be required for the center and side bearings of the four middle trucks, in order to allow for lateral movement across the underframe in curving. This would add to the weight and expense so that the weight of empty car per ton capacity and its cost would probably be equal to or greater than that of the present standard high-capacity steel car. The same would be true of the four six-wheel trucks but to a larger extent, in regard to the truck construction. A six-wheel truck with its pedestals, equalizers, double bolsters and center bearing truss is a heavy and complicated structure for use in freight service. It would be necessary to have brakes on the middle wheels, and the levers and connection required for this not only interfere with inspection, but are difficult of access for repairs; and if not kept in repair they become sources of accident. A six-wheel truck in freight service would be about as troublesome a thing as ever came before an interchange committee, but it will be necessary to use it if any material increase is to be made in present maximum car capacity.

The 50-ton steel car has now been in use ten years, and the restless spirit which dominates our intensified industry stands ready, no doubt, to demand something larger if and whenever conditions will permit; but in view of the obstacles in the way it seems likely that the present maximum capacity will remain standard for some time to come. The most recent opportunity for such an increase was the new equipment for the Virginian Railway, where coal cars are to be run from the mines directly to the car dumpers at the seaboard, and will not be sent over other lines. While there might be some advantage in a moderate increase over 50 tons capacity in such a situation, the decision was to adhere to present practice. The 100,000-lb. coal car for the Virginian Railway was illustrated in the *Railroad Age Gazette*, June 12, last. The maximum load for the M. C. B. Class D axle is 38,000 lbs. Driving axles on locomotives are loaded to 45,000 lbs. and 50,000 lbs., but they are equalized and the load is supported on long plate springs having an easy motion. With car wheels, much smaller than drivers, and constantly liable to develop flat spots, or to be out of round, and making more revolutions per mile, loads of 25 tons per axle would be much more severe on the track. Locomotive wheel weights, if made common in freight car service, would so damage any ordinary track that it would be practically impossible to keep it in fit condition for fast passenger service.

While, therefore, the reporters and fiction mongers will, very likely, work up a good bit of copy out of the remarkable "progress" which they will infer from the incorrect Pittsburgh

news item, it will be well for the rest of us, who have to deal with the actual conditions of track maintenance, bridge loads, train speeds, economical loading and interchange, to keep our mental temperatures normal.

WASHING AND FILLING LOCOMOTIVE BOILERS WITH HOT WATER.

The theory which explains the sudden failures of locomotive boilers by cracked firebox sheets, broken staybolts and leaky tubes as due to expansion and contraction caused by rapid changes or inequalities in the temperatures is now generally accepted, and abundant proof of its correctness is found in practical experience. The most prolific cause of irregular temperatures in different parts of the boiler is the crude methods employed in washing out and refilling, and while this fact has been realized for many years the efforts which have been made, until quite recently, to improve this practice have been feeble and futile. The large expense connected with the repairs to fireboxes which have been cracked by cold water; the constant renewal of staybolts and the calking of tubes, as well as loss of service of the locomotive and the requirement of larger numbers of engines for a given amount of traffic, has justified a larger expenditure for the plant and appliances necessary to correct the evil than has usually been appropriated by even the most progressive managements. It has been demonstrated beyond question that the best way to prevent the damage due to irregular temperatures is to wash out and fill the boiler with hot water. Before describing the best modern methods of heating and using hot water for this purpose, the general practice in use heretofore may be briefly reviewed:

The injector wash-out, which has been used to a large extent, is not a satisfactory method as it involves a constant expense for live steam, it lacks capacity for rapid work, and when heating the water to a proper temperature the delivery has not a sufficient pressure for dislodging scale and mud. Large hot wells or cisterns have been constructed at a heavy expense and the roundhouse piped for blow-off connections to them, but in addition to the loss of heat by conduction and radiation, this method does not supply more than sufficient hot water for washing; and that required for filling must be heated by live steam from stationary boilers, or cold water is used.

Another system which has been introduced in recent years is the use of three lines of pipe in the roundhouse, one for hot water, one for cold water and a blow-off line. The hot and cold water are combined in a mixing box to obtain a given temperature, or the blow-off line is connected with that used for filling some other engine. This requires the constant attention of a man at the mixing box and there are too many variations in conditions of supply and demand to insure uniform temperatures either in washing or filling. In order to make such a system satisfactory it would be necessary to add tanks and pumps, and the expense would then be nearly as great as that required for one in which the work is done more rapidly and the temperature of the water for both washing and feeding is positively uniform and automatically regulated.

The committee of the Master Mechanics' Association which reported on the "best system of washing out and refilling locomotive boilers by blow-off lines and storage tanks," at the last convention, reached the conclusion that boilers should be washed out and filled with hot water, that the saving obtained by so doing will pay a good interest on the necessary investment, and that the best system is that which will do the work with the least change in the temperature of the boiler, at a minimum expenditure of heat, and in the shortest possible time. This brief but sufficient specification can only be met by the new method of washing and filling which is radically different from common practice, and while the discussion of the report indicated that some members thought it necessary to first cool down the boiler before washing and that the effect of hot water washing was to bake the mud and scale on the sheets, yet the committee, after a careful inspection of the new hot water plants and an investigation of the results obtained, has endorsed the principle of hot water washing without cooling and recommended that it be done as rapidly as possible.

Much of the work that has been done in developing the tank system of hot water washing has been experimental, and the various improvements and refinements which have been worked out are patented and were for a time the subject of patent litigation, so that it is doubtful if a satisfactory system of utilizing the heat from the blow-off steam and water in subsequent washing and filling can now be designed without infringing some of these patents.

Some of the systems which have been put in by the railroads at a large expense do not fully meet the requirements as laid down by the committee, and we can take up the several items in the specification to see how they were met by a few of the different plants. The definite results from the system which the committee regarded as the best and upon which it evidently based its specification, are as follows: First, as to "the least change in the temperature of the boiler"; while the temperature of the sheets has not been measured it can be assumed that the most uniform temperature of the boiler is obtained by that system in which the temperature of the wash-out and filling tanks are maintained uniformly.

In a test where the blowing off of steam and hot water from a large boiler occupied 35 minutes, the temperature of the filling tank was maintained uniformly at 193 deg. F.; the wash-out tank varied only from 183 deg. to 193 deg. In washing out, occupying 22 minutes, the temperature of the wash-out water was kept at a regular temperature of 152 deg. F. The filling of the boiler occupied only 13 minutes and the water in the filling tank did not vary perceptibly from 193 deg. The record of the performance of the plant, extending over a week when nearly 100 boilers were washed, showed that these temperatures were regularly maintained, and that it was possible to blow-off two boilers, wash out two and fill two, all at the same time, without causing any material fluctuation in the temperature of either wash or feed water. During this time very little live steam was used, and the maximum saving per boiler over the cold water method was 1,000 lbs. of coal and 2,500 gal. of water. This saving results from the utilization of all the blow-off water and steam.

In this system there are two large tanks, one for water used in washing and one for filling boilers, and each is connected to a duplex pump having a capacity of 400 gal. per minute. The roundhouse is piped with overhead lines—one 6-in. pipe for blowing off, one 4-in. pipe for washing, one 4-in. pipe for filling and two 1-in. circulating pipes. The total storage capacity in tanks and pipes is 18,000 gal. At each middle post in the house there are three 2-in. down pipes for blow-off, washing out and filling connections to the engines. The tanks have live steam and cold water connections with thermostatic valves which automatically control the temperature of the storage water. The cost of this equipment for a 50-stall roundhouse is about 9,500, but the good results obtained have shown it to be a wise expenditure.

In contrast with the uniform tank temperatures above shown, tests of other tank systems have shown that notwithstanding a large expenditure for tanks, pipes, pumps and regulating valves, the temperature in the wash and feed tanks fluctuates considerably and the desired uniformity is not obtained. For example, it was found that during the day when 12 boilers were blown off and washed, the temperature of the water delivered to the roundhouse for washing was at 8 a.m. 160 deg. F.; at 9 a.m. 120 deg.; at 10 a.m. 70 deg.; at 11 a.m. 110 deg; and at 12 a.m. 108 deg. In the afternoon the fluctuation was from 60 deg. to 120 deg. In a test of a cold water plant, with normal temperature 70 deg., the thermometer was place in the back head of the boiler 4 ft. above the mud ring, and the observations showed that in blowing off from 110 lbs. steam pressure to zero, occupying 30 min., the tem-

perature of the water was reduced from 310 deg. F. to 262 deg.; while washing out, occupying 20 min., from 235 deg. to 115 deg.; and while filling, occupying 20 min., the temperature dropped from 118 deg. to 80 deg. In firing up the water was heated from 85 deg. to 218 deg. in 30 min.

The second requirement in the report of the Master Mechanics' committee is that the washing out and filling be done with a minimum expenditure of heat, and the chairman estimates that the saving resulting from the use of the best tank system would amount to one-half ton of coal per engine. The third requirement of the specification is that the work should be done in the shortest possible time. This implies that the water and steam should be blown out together, the boiler washed at once and filled with hot water without any interval between operations.

We have seen that by the hot water tank method it is possible to blow off in 35 min., wash out in 22 min. and fill in 13 min., a total of 70 min. With a boiler filled with hot water it is possible to get up 100 lbs. of steam in 25 min., so that the minimum delay for the whole wash-out operation is 95 min., and, allowing for ordinary delays, the work can be done regularly in 2 hours. The time required for these operations by ordinary methods is 4 to 6 hours, and this saving in time which is accomplished by the hot water system is sufficient in itself in busy seasons to so add to the effective power equipment as to result in a saving of $20,000 interest per year where there is a total equipment of 1,000 locomotives. The direct saving due to the hot water system will average: for coal $1, water 15c., labor 30c.; total $1.45 per engine. With engines washed out once a week and an equipment of 1,000 locomotives this would be 50,000 wash-outs per year; with a saving of $1.45 each there would be a total saving for the year of $72,500, which, added to $20,000, the saving in interest on the added equipment required by the old system, makes a substantial total of $92,500, which it is estimated can be saved by any large road by the introduction of a good system of hot water washing and filling. All the roundhouses required for the care of 1,000 engines could be equipped with such a system for less than that amount, so that the plants would be paid for in one year out of the saving they produce; and the expenditure is well justified if the results are guaranteed.

BOSTON & MAINE.

The Boston & Maine and its controlled lines lie wholly within New England, and its traffic partakes very much of the character of a switching road for the manufacturing industries of northern and northwestern New England. In this it is comparable to the New York, New Haven & Hartford, of which it is properly an extension, but in the case of the New Haven road there are two factors which are entirely lacking in the Boston & Maine situation. The New Haven is a trunk line from Boston, Mass., to New York and as such handles through traffic from New England to the South. It also connects with the New York, Ontario & Western, and by virtue of this connection and its control of the Ontario & Western, handles through traffic from New England to the west and to the Great Lakes; thus the New Haven does a very large local business for which it has an outlet, while the Boston & Maine has no outlet over controlled lines for the traffic that it originates.

At the beginning of the fiscal year ended June 30, 1908, the New York, New Haven & Hartford owned 10,994,900 shares out of a total of 27,488,100 common stock outstanding of the Boston & Maine. During the past year the question of greatest interest to Boston & Maine stockholders has been the possible merger of this road with the New Haven. Certainly the facts brought out by the annual report and by a study of the geographical position of the two roads indicate that both stockholders and shippers of the Maine road would profit by a merger with the New Haven, but this was not the opinion of the Massachusetts legislature nor the sentiment of Massachusetts business men as represented. Owing to suits brought by the state and to hostile public opinion, the New Haven was forced to sell its B. & M. holdings, and these shares, carrying a practical if not a theoretical control of the company, are now held by John L. Billard, a banker, of Meriden, Conn. It is reported that interests closely connected with John L. Billard have acquired very recently enough additional stock to constitute an absolute majority of the shares outstanding. This is the situation as it stands at present, and the pressing need of some arrangement by which the Boston & Maine will find an outlet for its traffic and a strong controlling interest which shall improve the road and put it in first class condition, is amply illustrated by the figures given in the report for last year.

Total operating revenue was $38,990,749 last year, a decrease of 5 per cent., while net operating income was $9,636,552 against $10,156,859 in the previous year, a decrease of 5 per cent. Freight earnings are very largely responsible for the marked decrease in gross. They were $22,486,065 last year as against $24,780,454 in 1907. As freight revenue was 58 per cent. of the total revenue of the road, the slight increase in passenger revenue does not greatly lighten the rather gloomy prospect shown by the report. Like the New Haven, the Boston & Maine depends on the manufactures of New England for much of its freight revenue, and felt very quickly the depression in general business and the consequent decreased output of the New England mills and manufacturing concerns. But in a dull year, the company was unable to reduce the proportion of its operating expenses. When it had all, and more than all, the business offered that it could handle, its operating ratio was 74 per cent., while in 1908, with a great shrinkage in the tonnage offered, its operating ratio was 75 per cent.

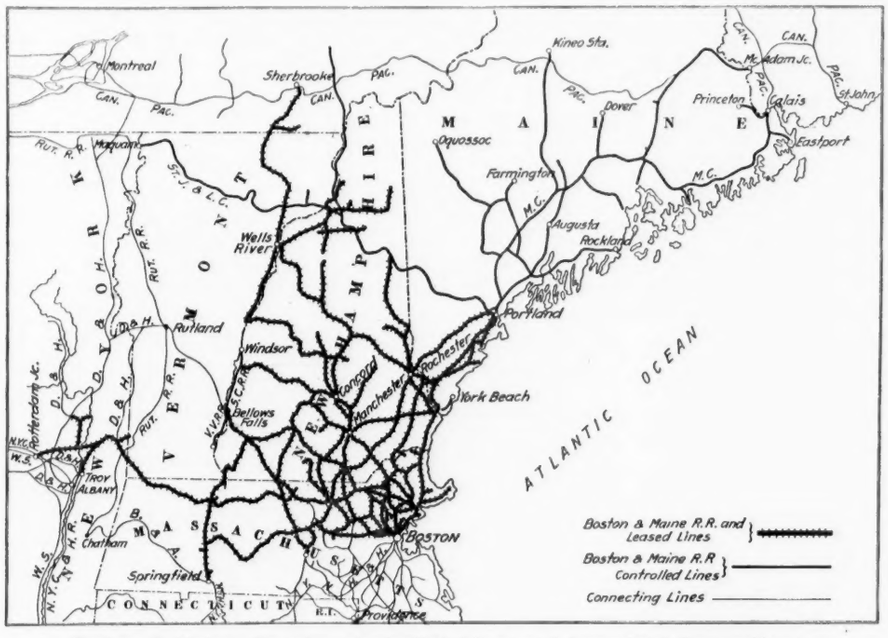
Maintenance expenses on the Boston & Maine are not accountable for its high operating ratio. Maintenance of way per mile of road operated cost $2,121 in 1908, as against $2,144 in the previous year, neither of these figures being extraordinarily liberal. Of the 2,242 miles operated last year but 549 miles were double tracked, and the report omits to say what proportion of the lines were laid with heavy modern rails and what proportion still had light rails. It is quite futile to make any comparison between the unit costs of maintenance of equipment, since the methods prescribed by the Interstate Commerce Commission are so different from the methods used previous to July 1, 1907. For instance, repairs of locomotives for 1907, as arranged in the 1908 report, cost $1,403,319, while as given in the 1907 report the figure appears as $1,351,253. The figures for repairs to freight cars and passenger cars for 1907 are not rearranged in the 1908 report. Taking the figures given in the report for last year we find that repairs cost: per locomotive $1,258, per passenger car. $341; per freight car, $50. There is a foot-note against the equipment account stating that under the head of renewals and depreciation, $863,795 was spent for new equipment, and included in operating expenses.

Conducting transportation is the item that shows the needs of the property most clearly. Under this head 49 per cent. of total operating revenues was spent in 1908; a decrease of less than 3 per cent. from the very high expenses in 1907.

The regular dividend of 7 per cent. was paid on the common stock during the year, although the annual rate has since been reduced to 6 per cent. The report states that part of the dividend was paid out of a contingent fund and part out of earnings.

State laws have greatly hampered the legitimate financing of the company's needs in the past. It is now possible, however, to issue bonds against the premium received from the sale of stock, and the company can now issue $12,000,000 bonds to pay its floating debt and increase its working capital. The stockholders last year authorized the issue of $6,000,000 bonds, but have since changed this sum to $12,000,000.

The balance sheet, however, shows that $12,000,000 will only bring the company out about even without giving it money for future betterment work to any extent. Cash assets on June 30, 1908, were carried at $13,238,303 as against $14,675,828 in the previous year, cash on hand having decreased from $2,115,701 to $1,680,246. Current liabilities on the other hand amounted to $17,043,687 at the end of 1908 as compared with $11,249,546 in the previous year; notes payable having increased from $3,700,000 to $11,053,000.



Boston & Maine, Showing Controlled Lines and Important Connections.

Traffic statistics and the character of freight traffic do not show marked changes from the previous year. The revenue train load was 237 tons last year, an increase of a little less than two tons, while the average number of tons per loaded car remained almost the same in the two years. The average haul increased from a little less than 99 miles to about 107 miles. The character of traffic carried does not account for the high operating ratio of the road. Of the 20,135,853 tons carried, 6,022,560 tons were products of mines, about half of this being bituminous coal, while products of agriculture, products of forests, and manufactures each contributed about 2,500,000 tons, the manufactures contributing rather more than the other two sources.

The future of the Boston & Maine depends so largely upon its control by some other company that it is interesting to speculate on the possibilities in this respect. As may be seen from the accompanying map, the Boston & Maine has connections on the north with the Canadian Pacific, on the east with the West Shore, and with the Delaware & Hudson. On the east and south it has connections with the New York, New Haven & Hartford, which itself has connection with the Great Lakes over its controlled line, the New York, Ontario & Western.

The advantages of the purchase by Mr. Billard of a controlling interest in the B. & M. are not obvious unless the stock was bought either for the purpose of selling it as a whole to some interest connected with one of the railroads just mentioned, or directly for the interest of one of these railroads. Denials are of course made by all of these roads that they have any interest in the purchase by Mr. Billard. The Canadian Pacific, which, by the way, is certainly free from the jurisdiction of either the Interstate Commerce Commission or the legislature of Massachusetts, should find the Boston & Maine an exceedingly profitable originator of traffic for its transcontinental and Atlantic seaboard lines. The advantages to be gained by the West Shore are obvious from the fact that Rotterdam Junction, the connection between the Boston & Maine and the West Shore, is the most profitable station on the B. & M., not excluding Boston, Mass. Purchase, however, by New York Central interests just at present does not seem likely. The Delaware & Hudson, which some one has said starts nowhere and ends nowhere, could seemingly tap New England to great advantage by an acquisition of the controlling interest in the B. & M. The Boston & Maine originates traffic, manufactures and merchandise, which should prove a very profitable haul for the D. & H. north into New York state and Canada, or south and west to Binghamton, while there would seem a great field for the sale in the territory reached by the Boston & Maine, of the coal mined along the D. & H. The advantages of an acquisition of the property by the New York, New Haven & Hartford have been so often pointed out and often discussed in these columns that little need be said about them now, except to repeat the self-evident fact that the two roads are in no proper sense competitive, but are naturally supplementary.

The following table shows the results of operation for the last two years. The figures for 1907, down as far as and including gross income, have been rearranged by the company to correspond to the classification prescribed by the Interstate Commerce Commission:

	1908.	1907.
Mileage operated	2,242	2,228
Freight revenue	$22,486,065	$24,780,454
Passenger revenue	13,537,388	13,306,719
Total operating revenue	38,990,749	41,060,525
Maint. way and structures	4,756,446	5,036,341
Maint. of equipment	4,760,813	4,887,257
Traffic	512,662	484,863
Transportation	18,621,959	19,168,968
Total operating expenses	29,354,197	30,221,720
Taxes	1,712,273	1,674,836
Net operating revenue	9,636,552	10,156,859
Gross income	39,748,549	41,722,140
*Net income	751,496	2,599,196
Additions and betterments	80,537	493,249
Dividends	2,080,621	1,973,332
Surplus or deficit	1,409,662	131,615

*This is income from all sources after deduction of fixed charges, rentals and sinking fund payments.

NEW PUBLICATIONS.

Railway Track and Track Work. By E. E. Russell Tratman, A. M., Am. Soc. C. E. The *Engineering News* Publishing Co., New York, 1908. 520 pages; 6 x 9 in.; 232 illustrations. Price, cloth, $3.50.

The third edition of Mr. Tratman's book has been re-written, amplified, and brought up to date. It is a compilation of the information in the standard plans, specifications and rules in effect on many railroads; with elementary definitions and descriptions of each branch of maintenance of way work, affecting maintenance of track, and structures closely affected by track. This is ten to twenty per cent. of the operating cost of a railroad, and surely deserves careful study.

The job is painstakingly done, and we shrink from criticisms of the long and accurate statement of facts. Yet the book is uninteresting, arouses no enthusiasm, and tackles no problem; but, like a dictionary, recites the practice on various roads, their road-bed construction, ballast, ties, rails and fastenings, switches, frogs, fences, and track accessories. The subject still needs the inspiring touch of a man like Wellington, in whose monumental book the figures are out of date, and

whose conclusions were sometimes wrong, even when the book was published; yet it is part of the necessary equipment in every general and division railroad office.

A roadmaster has always a fine problem; a hard nut to crack every day. He has to get economic results from several hundred laborers; men who quit the job if they have to learn more than three or four facts a year. Like a spider, they must be warmed up to work in winter. Like molasses, they spread themselves out to too great a distance if not kept cool in summer. Their health, temperament, and home life must all be considered to make them work harmoniously for a result a few hundred miles long. Choosing these men and their foreman, teaching and developing them, is the human side of his work. There are foremen whom a roadmaster never criticises, but converses with them until they suggest the change in practice he wishes to bring about. There are other foremen whom the roadmaster abuses regularly, and he includes their ancestors. They need it..

Tools and appliances are based on the men's capacity. A fraction of an inch in the size of a shovel makes cubic yards in a day and real money in a year.

The work herein indicated is surely 50 per cent. of the difficult duty of the maintenance of way engineer. It is here that the greatest help can be given him, and that help largely consists of incitement to study and enthusiasm for his really inspiring job. The trouble with some of these books—and we must class Mr. Tratman's writings here—is that they are too commonplace. For example, the subject of "protection of track work" opens as follows: "All work must be done with due regard to safety of trains," and it is followed by much that is alike uninteresting and not useful.

Of the remainder of the task, at least some is the engineer's financing, the expenditure justified by the traffic, the expenditure made necessary for safety. As a book of reference for students, rather than for those in active work, the book has a distinct value. It is logically arranged and well indexed. Few will fail to get some helpful suggestion from this clear statement of that part of maintenance of way work with which the trackman comes most directly in contact. F. B.

Letters to the Editor.

THE SMALL SHIPPER AND THE RAILROAD.

October 2, 1908.

To the Editor of the Railroad Age Gazette:

Your issue of August 28, page 796, contained a very interesting article by A. Hermany, Auditor of Passenger Traffic of the Chicago, Rock Island & Pacific, on the subject of "Unpopularity and the Remedy Therefor," as applied to railroads. Mr. Hermany is doubtless thoroughly conversant with his subject and should know what the bad effect of too much red tape and too many rules is, and he is doubtless right in his position that indiscriminate dishing out of rules and red tape by railroad officials is responsible to a great extent for the indifference displayed by railroad employees toward the public. Mr. Hermany's article is based on an intimate knowledge of the inside detail of railroad work. The writer's impressions and prejudices have been molded entirely by his outside experiences in the role of a small shipper, and he has been under the impression that it is rather a lack of rules and lack of systematic application that makes railroads in general unpopular with the small shipper.

Ninety per cent. of the prejudice that now exists in the minds of small shippers over the country is the result of arbitrary and dilatory tactics employed in claim departments. It would seem that this department has only one rule, which reads: "Pay as little as you can, and keep that little as long as you can." Not long since, one of our leading national weeklies commented editorially on the "cry-baby" railroad. They took as an example, Farmer Jones, who shipped a box of apples on which he paid an excessively high freight rate. Farmer Jones paid the freight without question and with no feeling that the charge was extortionate, but when the box of apples arrived at destination with 25 cents worth of apples short, and the railroad company set about its usual tactics in settlement of the claim, Farmer Jones sat up and took notice of the treatment. And the loss of this 25 cents had not ceased to rankle in his bosom when he went to the polls the next time to cast his ballot.

The writer feels very much like Farmer Jones must have felt. To cite instances: Some months ago the writer's company bought from a northern packer a car of dry salt meats, and on arrival of freight we tendered the railroad company a bill of lading showing all freight prepaid, and bearing the weight inspection stamp of the Joint Rate Inspection Bureau of the Trunk Line and Central Freight Associations. This car was delivered at destination by a line operating under the jurisdiction of the Western Weighing Association. On arrival of the shipment the local freight agent had the car, which contained an unknown quantity of ice, run over track scales. He then took the light weight stenciled on side of car from the gross weights registered by his track scales, and advised us that the excess weight shown by this method, which was not covered in the bill of lading, must be paid for before freight would be delivered. We immediately pointed out that weights taken in this way meant absolutely nothing, but the agent, either through stubbornness or ignorance, insisted that his position was right and the money must be paid in accordance with his figures or no freight would be delivered. We appealed the case to the commercial agent of the jurisdiction, and, being a sensible man, he readily acknowledged the asininity of his local agent's procedure; but he told us in order to save time we had better humor the local agent and pay the excess demanded, and that he would personally see that we were refunded in full in the course of a very few days. Acting on his personal assurance and solicitation, we paid the excess freight. When the car was unloaded, we insisted on a freight inspector being present to check the weights. The meats were weighed as dry salt meats are usually weighed, first with the loose salt on the pieces of meat, after which a sweep test was made, as is customary, in order to determine the percentage of loose salt in the car. Net weights are arrived at in this manner. The railroad inspector, who was a Western Weighing Association man, turned in as his report the *gross* weights of the meats and the salt, showing an excess weight of about 4 per cent., instead of net weight, as he should have done.

Our claim covering the amount paid over billed weights was promptly filed. With our claim we submitted to the railroad company original bill of lading bearing weight inspector's stamp, original invoice, a statement from the shipper that invoiced weights were correct, and, in addition to this, a certified statement signed by the chief inspector of the Inspection Bureau above referred to, certifying that the car was correctly billed.

To make a long story as short as possible, the commercial agent who saw the justice of our claim was not able to make his promise good. The file of papers got into the usual mesh of red tape in the claim department, and, after several months, the railroad company proposed that they refund us only down to the total gross weights of the meat and salt as taken by their local weight inspector. This proposition we promptly declined and with our letter of declination we cited full tariff authority, which very plainly provided for the use of ice as well as salt on bulk meats without the payment of freight on either. We insisted either on full payment or that we be cited later tariff authorities by the claim department bearing out their position. All that we got from this was a flat-footed bull-headed refusal, without rhyme or sensible reason, from the claim department that they would not pay the claim. This

claim has never been settled and is too small to justify the expense of suit.

We at present have another claim covering loss and damage to a shipment, which was unreasonably delayed in transit as the direct result of an arbitrary diversion in transit made by the carrier. The bill of lading explicitly directed certain routing via certain lines. The railroads (several being involved), disregarded the shipper's instructions and hauled this shipment, which was perishable, as to best suit them. In other words, instead of turning it over to foreign interests at a division point, they arbitrarily retained the tonnage on their own lines and the lines of their allies. This claim has now been pending several months. We have talked to several general agents representing the combination of railroads at fault, and not one of them questions the justice or validity of the claim, but each man puts in his time laying the blame on the other fellow; and until they get through fighting among themselves and settle on whom the guilt shall rest, we are holding the bag. These are two fair examples taken from our claim record. We could, if space permitted, cite many additional cases of similar nature. This kind of treatment of the public by the railroads helps mold public opinion, and public opinion governs. The writer has lost all patience with railroads as managed to-day, and is in favor of more legislation of the so-called "adverse" type. We hope that Farmer Jones and his crowd will continue to harass the railroads through state legislation until the railroads are brought to a full realization of their duty and obligation to the public.

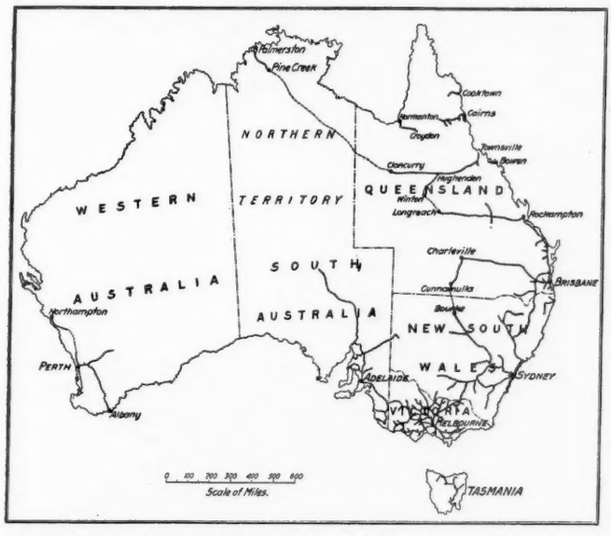
A SMALL SHIPPER.

TRANSCONTINENTAL RAILROADS IN AUSTRALIA.

Brisbane, Queensland, July 24, 1908.

TO THE EDITOR OF THE RAILROAD AGE GAZETTE:

I have just read an editorial in your paper of May 22, dealing with proposed transcontinental railroads in Australia, and would point out to you that the completion of one such line



Australian Railroad System, Existing and Proposed.
Suggested extensions shown by broken line.

is easily within reach, and it is trusted that the one train a week would not be nearly sufficient for the traffic.

The northern territory of South Australia is by no means barren in the north, and the greater part of Queensland is covered by pastoral settlement. At present, as you will see from attached map, there is a line from Melbourne through Sydney and Brisbane to Longreach. A line from Longreach to Winton, 120 miles over easy country, would connect with a line, roundabout of course, to Cloncurry, and from Cloncurry to Pine Creek (the southern terminus of the Port Darwin line) is only about 700 miles, or 820 to build as against 2,540 already constructed.

Eventually this could, of course, be much shortened by going from Melbourne to Bourke over existing lines, build to Cunnamulla, thence to Charleville, Longreach and Cloncurry and so on as before mentioned. Incidentally, I would like you to notice that we have in Queensland 3,360 miles open for traffic and over 500 under construction.

W. PAGAN,
Chief Engineer, Government Railways.

THE WEIGHT OF LOCOMOTIVES.

Mobile, Ala., September 28.

TO THE EDITOR OF THE RAILROAD AGE GAZETTE:

In a very thoughtful article by Prof. William Z. Ripley on "The Theory of Railroad Rates," in your issue of September 18, this statement occurs: "The average weight of a locomotive at the close of the Civil War was approximately 90,000 pounds. This has increased in somewhat the following proportions: To 1881, 102,000 pounds; to 1893, 135,000; to 1895, 148,000; to 1898, 230,000; rising in 1900 to 250,000."

The increase in the average weight of locomotives between 1895 and 1898, as stated above, seems to me to be incredible, and not less so is the statement that the average weight of locomotives in 1900 was 250,000, or 125 tons.

Cannot the real explanation of this seeming improbability be found in the fact, that the writer of this able article, used the weight of the locomotives up to and including 1895, and the weight of the locomotives and tenders for the subsequent period named?

R. V. TAYLOR,
General Manager, Mobile & Ohio.

Contributed Papers.

COMPENSATION OF RAILROADS FOR HAULING THE MAILS.

Mail representatives of a number of western and southwestern railroads had a conference at Washington recently with George von L. Meyer, Postmaster-General of the United States, on the subject of compensation of railroads for hauling the mails. At this conference Mr. Meyer was presented with statements setting forth the views of the railroad companies represented upon this subject and recommending changes in present laws and rules of the Post Office department. The representatives of the railroads who presented this statement were as follows:

H. E. Mack, representing the Missouri Pacific and Iron Mountain system, the Denver & Rio Grande, the Texas & Pacific, the International & Great Northern and the St. Louis Southwestern.

J. P. Lindsay, representing the Atchison, Topeka & Santa Fe.

Guy Adams, representing the Chicago, Rock Island & Pacific, the Chicago & Eastern Illinois and the Trinity & Brazos Valley.

G. B. Lindsay, representing the Wabash, the Wheeling & Lake Erie, the Wabash-Pittsburgh Terminal and the Missouri, Kansas & Texas.

The statement, which treats of the subject of compensation of railroads for hauling the mails more exhaustively, perhaps, than any other paper ever prepared, is as follows:

The undersigned railroad companies beg leave to direct your attention to two matters of importance, which in equity, we believe, may fairly claim your consideration, and favorable action by Congress, viz.:

First.—Specific payment for the post offices which are furnished, maintained and operated in railroad cars, as an extra transportation facility.

Second.—Provision for annual weighing of the mails, and annual adjustment of pay.

An entirely erroneous impression exists in many quarters

and pervades the postal service to a large extent, that railroads are extravagantly paid for carrying the United States mail; some credulous people even believing it to be the principal course of their revenue.

The reverse is true. Reports of the Interstate Commerce Commission show that only one-fiftieth of gross operating revenue is derived from carrying the mails. The earnings from mail do not keep pace with other earnings, as the following increases from 1905 to 1907, taken from Interstate Commerce Commission reports, will show:

Increase in freight earnings	$183,265,343
" " passenger earnings	92,011,611
" " express earnings	12,183,776
" " mail earnings	4,952,839

With the tremendous growth in postal revenue, there would naturally be an increase in the cost of carrying the mail, considering that the railroad mileage grew from 63,457 miles in 1873 to 230,000 miles in 1907; yet the proportion of postal revenue expended for carrying mail on railroads is practically the same, and during the past six years has decreased 8 39 per cent., while the expense of other forms of mail transportation has increased, and in branches of the postal service, outside the Second Assistant Postmaster-General's bureau, the increase was 9.97 per cent. and growing.

Since the enactment of the law of 1873 the following reductions in railroad mail pay have been made: July 12, 1876, 10 per cent. general reduction; June 13, 1878, 5 per cent. general reduction; March 2, 1907, 5 per cent. reduction, weights 5,000 to 48,000 lbs. daily; 10 per cent. reduction, weights over 48,000 lbs. daily; 16.66 per cent. reduction in full R.P.O. car pay; June 7, 1907, 9.65 per cent. general reduction by Postmaster-General's Orders 165 and 412.

Notwithstanding the vastly improved service afforded the government, these later reductions were ordered, although no comprehensive investigation appears to have been made since the exhaustive study of the subject by the Commission of 1898, which reported adversely to reductions advocated in some quarters. With regard to the later reductions, the railroads suffered from two separate directions: first, from Congress, to the extent of $3,482,147.76; and, second, from Orders 165 and 412, by the Postmaster-General, $4,619,285.85; total $8,101,433.61. (Mr. Overstreet's table in Congressional Record, March 2, 1908, page 2871).

Our purpose is to show that the reductions from two sources, not acting jointly, are very excessive, and in fairness, warrant adjustment on an equitable basis by the Department and Congress. It seems a fair assumption, from debate in Congress in 1907, that its final action, in the reductions quoted, was based upon the idea that it was making an adequate reduction, and had there existed in Congress knowledge of the purpose to issue Order 165, it may be assumed that Congress would not have acted.

While the reductions in pay were ordered at a time of great national prosperity, the railroads were nevertheless then laboring under greatly increased cost for materials, and wages had reached a maximum, rising with the tide of prosperity, and the reductions are applied under depressed conditions, when every loss is material.

The mails are given a preferred service, over all kinds of transportation, and the railroads form the very foundation of the whole postal service, and are the chief factors in its efficiency and achievements. The city carrier, rural carrier and railroad mail service are all dependent upon it. The letter mailed at the close of business in the evening, which is upon the desk of the business man 500 miles distant the next morning, bears testimony to our marvelous postal service; but it is the railroad trains traveling through the night that accomplish this for the government and the public, and they are entitled to recognition and fair consideration.

The rural carrier service, with its handful of letters per route, costs over $35,000,000 annually, approaching the cost of carrying the mail on railroads, which is $45,000,000, and there is no comparison as to services rendered.

We take note of the fact that while reductions of railroad mail have taken place, amounting to $8,000,000, there have been notable increases of expenditure in other branches of the postal service, as follows:

	Appropriation Bill, effective July 1, 1906.	Bill, effective July 1, 1908.
Postmasters' salaries	$26,123,800	$28,754,000
Railroad mail clerks	15,000,000	18,580,000
City carriers	22,228,000	29,135,000
Post office clerks	22,700,000	28,726,500
Rural free delivery	28,200,000	35,573,000
	$114,251,800	$140,769,500
		114,251,800
Aggregate increase in two years		$26,516,700

APARTMENT CARS.

That the pay for carrying mails was inadequate, is illustrated by the earnings from apartment car service. The following table may be considered as fairly representative of general conditions throughout the country, as it embraces 84,079 daily car miles, out of a total of 301,641 miles, over 35 per cent.:

Size mail compartment.	Daily car miles.	Earnings per car mile, cents.	Earnings per car mile (Order 412) cents.	Fares of clerks working mail, cents.	Earnings from carrying mail, cents.
30 ft. cars	45,408.40	10.01	9.05	4	5.05
25 to 29 ft. cars	12,295.32	9.24	8.35	4	4.35
20 to 24 ft. cars	13,399.94	7.21	6.52	2	4.52
15 to 19 ft. cars	5,808.20	7.56	6.84	2	4.84
Under 15 ft. cars	7,669.28	4.56	4.12	2	2.12

It will therefore be seen that the railroad companies received for carrying mails in apartment cars, but little in excess of the fares of the railroad postal clerks, who perform the postoffice work of distribution in these cars. The inadequate pay arises from the demands upon the railroad companies for distributing space or post office work in these cars, entirely out of proportion to the trivial weights carried.

The weight earnings are not adequate as an exclusive method of pay, and therefore additional pay should be given for the excess space used for the distribution, which is entirely apart from and not related to, the ordinary transportation functions of the railroads.

The daily average weights in these cars are only as follows:

30 ft. cars	1,474 lbs.
25 " "	764 "
20 " "	452 "
15 " "	275 "
10 " "	162 "

With the development of the country, and the growth of post offices and rural free delivery service, and the greater frequency of train service, there has been a finer development of schemes of distribution in the railroad mail service, resulting in growing demands for apartment mail car space and distributing facilities, until now even the 25-ft. apartment car has more distributing facilities (viz., 180 letter boxes and 92 paper separations) than the 60-ft. fast mail letter cars (94 letter separations and 92 paper separations) of 30 years ago, yet there have been many reductions in pay.

The ordinary function of the railroad would be to carry the mail in pouches and sacks, but in addition to this carrying of the mail itself, apartments in mail cars must be fitted up as post offices with letter cases and paper boxes, iron racks, tables, drawers and mail catching devices for distribution en route, requiring ten times as much space as for transportation of the small weights involved, and these apartments must be operated, hauled, maintained, and from one to three post office clerks must be carried to perform the post office distribution.

For the convenience of the postal clerks these apartments must be fitted up with private ice water tanks and ice water, a private tank of wash water and wash basin, private clothes closet and private toilet accommodations. The cars must also be lighted and heated not only *en route*, but for hours before their departure on their runs, for advance post office distributing work, as an economy in the number of postal clerks employed or to save distribution and perhaps delay, which would occur if mail went into junction post offices to be handled.

In connection with this advance distribution there are extra switching movements of the mail cars necessary in and about terminals, track space in the terminals is occupied and extra porterage work in loading by the companies is necessary. All of these requirements are appurtenant to the post office work done in these cars, and would not be required simply in connection with the transportation of the mails in bags and sacks.

Beyond this, however, for these small earnings on apartment cars as described, the companies must erect and maintain mail cranes; make shortage slips; carry the mail between terminal post offices and stations regardless of distance, and between intermediate post offices and stations, within 80 rods, which has now become very burdensome, and, besides, are expected to carry officers of the postal service, together with post office inspectors, free, over all lines.

The frequency of train service to meet passenger requirements, splits up the weight of mail, so as to operate against concentration or consolidation of weights by the companies, for economies, and this frequency, which improves the mail service, deprives the companies in many cases of full railroad car pay, which they would receive if the weights could be consolidated. But mails must be carried on every train, as the Department demands.

Quite generally where 30 feet or 25 feet are required for mail, it encroaches so much upon the passenger or baggage space as to require the hauling of one extra car, and, in instances, splitting of trains over grades or the use of two engines.

Payment is fixed on an average basis for the length of routes, yet the daily faciliities furnished by the railroad must be on a maximum basis to care for the heaviest mails received, as mail apartments cannot expand or contract with the daily fluctuations of mail.

We may demonstrate the inadequacy of pay in a concrete way, by saying that in a 30-ft. apartment, the Government gets 285 sq. ft. of floor space for 10.01 cents per car mile, whereas five passengers on the same train would pay more than that and only occupy 30 sq. ft. of floor space. The Post Office Department receives nearly ten times as much space for the same money. Another example more strongly in contrast is the average 30-ft. freight car, earning approximately 16 or 17 cents per car mile, nearly twice as much as similar space in a mail car. The contrast as to service is more marked, the mail car being carried on fast trains, at 25 to 60 miles per hour, while the freight car is hauled on slow freight trains.

The cost of building mail cars is about ten times as much as the cost of building freight cars, crude and bare, and the expense of maintenance of freight cars is small by comparison. Besides, the mail car, on account of its fittings, can never be used for any other kind of service whatever.

It being demonstrated that the pay on a weight basis alone is inadequate, we ask a moderate rate for the post offices furnished, maintained and operated in our cars in addition to the weight pay, and offer the following for consideration by the Department and the Congress:

30 ft. apartment cars.....	$15	per mile	per annum
25 " " "	12	"	"
20 " " "	9	"	"
15 " and under apartment cars...	5	"	"

We specifically wish to say that we do not regard this as fully compensatory, but propose a rate for consideration that is within bounds of adjustment.

ANNUAL WEIGHING.

It is so obviously unfair and unreasonable to ask the railways to carry increasing weights of mail for four years between present quadrennial adjustments that no argument appears necessary; in fact, your letter of April 23, 1908, to the Senate Committee, recognizes this, and we request that in due course the Post Office Department, now fully empowered by law to do so, adopt the method of annual weighing.

By the present system, the Department in instances pays two railroads for hauling the same mail, and in others pays one for service performed by another. A simultaneous weighing annually would adjust these conditions reasonably as far as practicable.

FINES FOR DELAY TO MAIL TRAINS.

We respectfully ask discontinuance of the general practice of fining railroad companies for train delays. The burden, injustice and futility of this was laid before the Committee at the last session of Congress, in the following memorandum:

"The transportation business on railroads is upon a 'carriage' basis; that is, for given rates the various classes of traffic are carried over the railroad lines from point to point, but, although schedules are provided, as a matter of necessity, they are expressly 'not guaranteed,' and the carriers' reservation is printed on public schedules.

"The very nature of railroad train service renders it impossible to guarantee schedules. Railroad operation and development, with the necessary reliance upon the combined human and mechanical agencies, have not reached that stage of perfection which will assure the maintenance of schedule. Various conditions of weather and climate and the fluctuations of traffic from day to day, especially on single track roads, in practically pioneer country, render it impossible to guarantee schedule, as those connected with railroad operate recognize but seek to overcome by every available means.

"It is unreasonable and ineffectual for Congress and the Post Office Department to demand of an incidental mail service what cannot be done for a vastly more remunerative passenger and freight traffic, which enables the railroads to exist. The Interstate Commerce Commission report for 1906, page 87, strongly emphasizes this fact, showing that of gross earnings of railroads in the United States amounting to $2,325,765,167, but $47,371,453 was derived from carriage of mail.

"It will with certainty be conceded, as an indisputable fact, that 2.04 per cent. of operating revenue, or the possible loss of a portion of that amount, cannot induce a closer adherence to schedules than 97.96 per cent. of its business, with the strong factor of competition, the most forceful incentive to effort, concerned throughout.

"The Post Office Department and the public are enabled to secure their efficient mail service because passenger traffic demands operation of trains and regulates their frequency and schedules, but mail earnings, with but few exceptions, do not warrant special service.

"The postal service, therefore, cannot reasonably condemn and penalize for delays a service supported and which exists by reason of other revenues—the mail deriving incidental advantage therefrom.

"The penalties and the labor and expense incident to fine for delays are productive only of dissatisfaction, discontent and discouragement to railroads striving to improve service by such frequency of train service and expeditious schedules as traffic demands."

Congress omitted this item from the current appropriation bill for the purpose of stopping the practice, and was informed, I believe, that this would be followed by its discontinuance. The Department sought to lighten the burden, but in endeavoring to reduce fines required a burdensome and expensive report, one almost impossible to make satisfactorily because of the intricacies of detail, and not in harmony with ordinary operating reports of conductors, train despatchers and superintendents.

It serves absolutely no good purpose, does not and cannot accomplish improvement in train service, and simply results in burden and expense to the companies and the withholding of moneys duly earned for the carriage of mail. Perhaps nothing has ever been attempted that is so very annoying, almost to the point of persecution, without benefit.

FOREIGN RAILROAD NOTES.

Grain and flour shipments by rail from Siberia were 22,168,000 bushels in 1907, against 13,219,000 in 1906 and 8,594,000 in 1905.

The opening of the Hedjaz Railroad from Damascus to Medina, about 930 miles, was celebrated Sept. 1. The remaining 185 miles to Mecca are to be completed in about two years. The railroad is built primarily for pilgrims to the two holy cities, from which infidels are excluded; but incidentally it will enable Turkish troops to keep in order the wild Arabian tribes hitherto almost inaccessible on account of the desert.

For the first half of this year the production of pig iron in Germany was 6,049,721 kilometric tons, against 6,355,953 in

1907, a decrease of only 5 per cent., against nearly 50 per cent. in this country.

What we would call a baggage transfer company has recently organized in Berlin, having arrangements with the State Railroads not only for collection and delivery of baggage and its transfer between the different city stations; but also for express goods delivery.

HOPPER BALLAST CAR FOR BURMA RAILWAYS.

The Leeds Forge Co., Ltd., of Leeds, England, has recently delivered 50 all-steel hopper cars to the Burma Railways, to be used for ballast purposes. The principal dimensions of these cars are as follows:

Length over buffers	17 ft. 9 15/16 in.
Length over end sills	14 ft.
Width over all	6 ft. 7 in.
Height over all	6 " 2 "
Length, inside	14 " 0½ "
Width, inside	6 " 6⅛ "
Wheel, diameter	28 "
Wheel base	8 ft.
Journals	3½ in. x 7 in.
Journals, center to center	4 ft. 8 "
Capacity	14 tons
Gage of track	3 ft. 3.37 in. (1 meter)

The cars are interesting both because of the local practice which they exemplify and the peculiarities of construction which they embody.

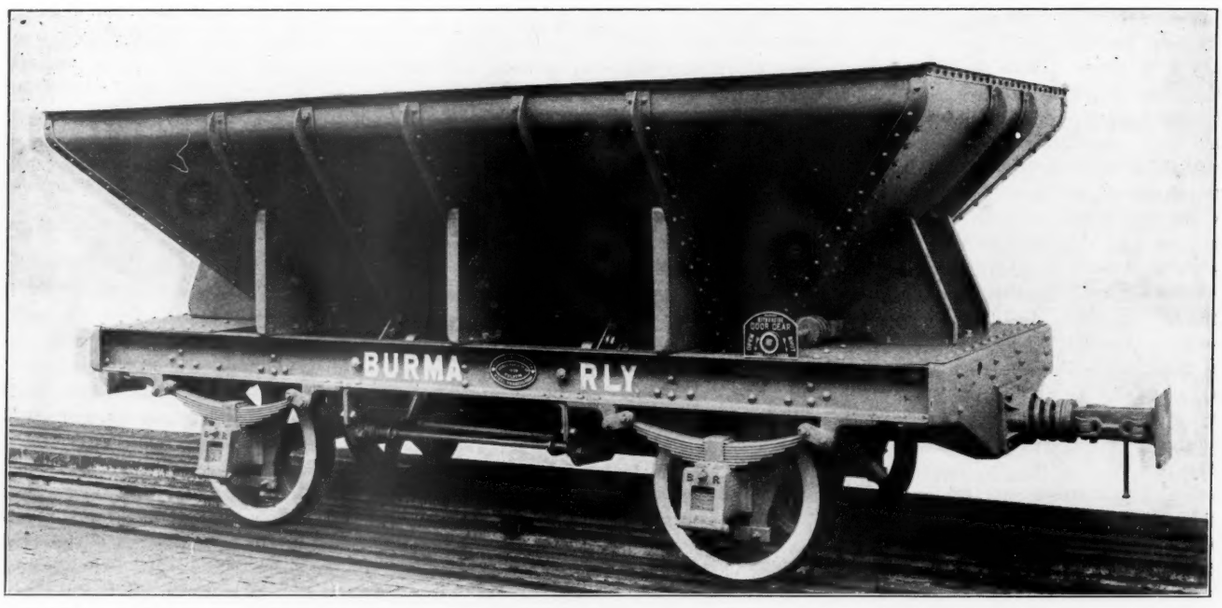
It is, of course, quite natural that the cars of a narrow-gage road should have a lower capacity than those to which we are accustomed in this country, so that the comparatively low capacity needs no comment. In the details of construction we find a combination of rolled and pressed steel shapes. The side sills are channels, but the cross-ties, end sills, buffers and brackets are pressed. The stiffening members of the sides are also rolled angles, showing that there is considerable modification in these cars from the practice of the same building firm of a number of years ago, when pressed steel work was carried into all the details of construction, wherever it was possible to do so.

The coupling and draft gear are peculiar. Instead of the usual side buffers of European practice, there is the single buffer in connection with the coupler at the center of the car on the American plan, but differing in that instead of using a single spring for both buffing and hauling, there are two springs put in tandem, one for buffing and the other for hauling, and both with a bearing against the plates of the end sill. The coupler, too, is peculiar, and a modification of the European screw arrangement. A hook is pivoted rigidly to one drawbar, and this drops over an adjustable pin in the opposing one. This adjustable pin is held at one end by a link leading back to an equalizer pivoted to the back end of the drawbar. The other end is connected to the opposite end of the same equalizer by a right-and-left screw and nut. The hook is, therefore, dropped over the adjustable pin and the latter is tightened by the screw. There is no spring compression between the parts so connected, and it is only possible to draw the two together without any pressure beyond that exerted by the screw in rigid connection. This arrangement, also, evidently necessitates the use of mated but not similar drawbars on the two ends of the car.

The brakes are applied to such of the cars as are provided with them by a long lever at the side of the car attached to a shaft with short operating arms having connections leading direct to the shoes. It is of much the same design as that used in this country years ago on the four-wheeled "jimmies" employed on the anthracite coal roads.

The spring suspension uses the semi-elliptic spring set directly on the axle boxes, with the latter held by the usual horn plates of English practice.

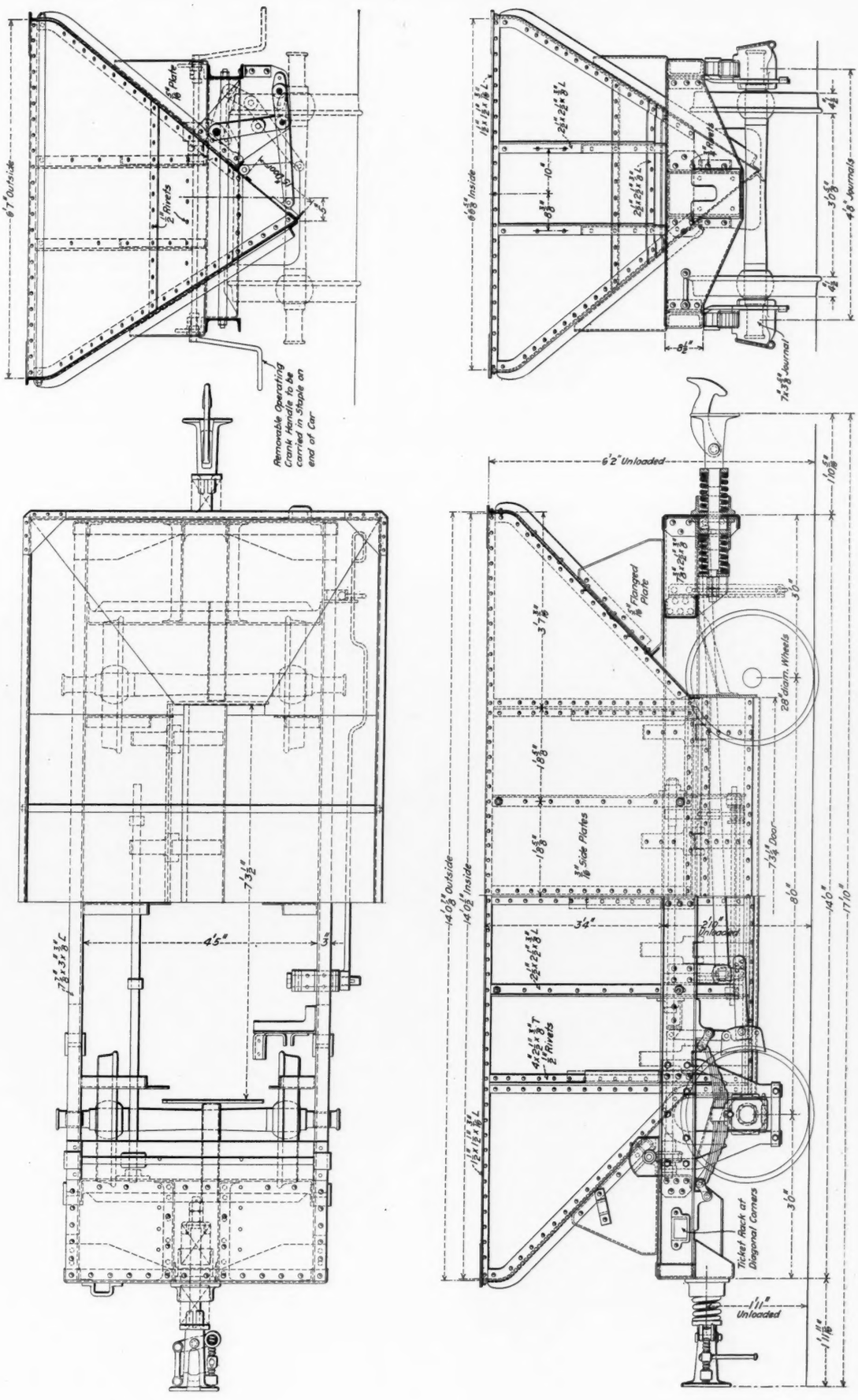
The body of the car is V-shaped in cross-section, and is fitted with hopper door at the bottom, that can be opened to discharge from either side, but only allows the load to come out in one direction, as indicated in the illustration. As the opening is near the center of the track, this feature is a matter of little moment, simply necessitating that the ballast shall be deposited nearer one rail than the other.



Hopper Ballast Car; Burma Railway.

The doors are opened by simply turning the transverse shaft, which gears by means of a worm and wheel into the longitudinal shaft that runs along the side of the car, and which, in turn, is attached to the swinging edge of the door by a series of links, so that it can be opened to any extent, or even closed against the pressure of the ballast, if desired. When partially opened the friction of the worm and gear is sufficient to hold the door in any position.

As the car is light, weighing somewhat less than 4 tons, it seems as though the same or a similar design could be adapted to contractors' service in this country for hauling out over the light trestles frequently employed in construction work.



Hopper Ballast Car; Burma Railway.

FREIGHT CAR WORK AT WEST MILWAUKEE SHOPS.

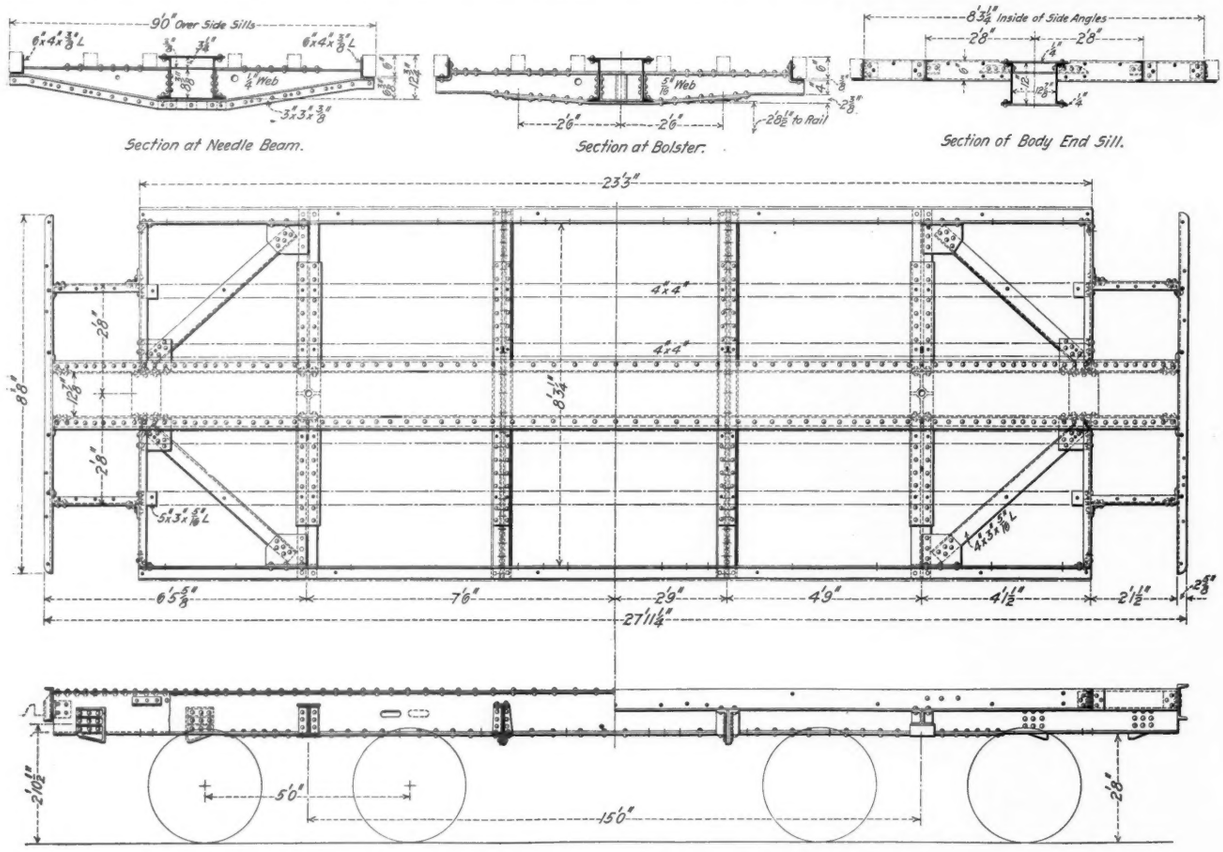
The steel underframe stock cars of the Chicago, Milwaukee & St. Paul were described in these columns June 12. The West Milwaukee shops of the road have built 2,500 of these cars, turning them out at the rate of 28 a day. That is, they put on the wooden superstructures at this rate. The underframes and trucks were built by the Bettendorf Axle Co., Davenport, Iowa. On receipt at the shops, the underframes were stored in a yard next to one end of the freight car erecting shop. This storage space is served by an overhead electric traveling crane. The lumber yard is arranged with tracks and turntables. The large mill, which handles the material for the framing, has three pallelel tracks through it and the tools are arranged so that the material goes in a direct line, without crossing from side to side. A smaller mill turns out the roofing, siding, etc.

The freight car erecting shop, which is an old wooden building, has nine tracks, eight of which are used for car erection. Each track has room for 14 cars. Two tracks full of cars are therefore finished every day. These are pulled promptly at 9 o'clock each morning. As soon as the tracks are cleared, the prepared material from the mills is brought in from one end of the shop and distributed along the tracks, and the iron work from the car department's blacksmith shop is brought in at the other end and likewise distributed. Roofing, carlines, etc., for the upper part of the work are put on the scaffolding to be ready at hand when needed. Meanwhile the steel underframes, mounted on their trucks, are being brought in from the yard. The trucks are assembled on the ninth track of the shop, which is used solely for that purpose. A view of this swing-motion truck, both assembled and knocked down, to illustrate the few parts composing it, was shown with the description of the car referred to above. One of these trucks is assembled by the men quite easily in 10 or 11 minutes; this can be done in 7 minutes. The trucks are wheeled out into the yard, a steel frame set thereon by the crane, and the whole run into the shop, small turntables in the tracks enabling this to be done readily.

One gang of men attaches the underframe timbers, and other gangs erect the bodies, put on the roofs, etc. This represent the first and second days' work, except that the painters follow right behind the body gangs with the first coat. The second coat is applied the next day, and on the fourth the cars are lettered and made ready to ship. About 345 men are engaged on the stock cars, and are paid by the day.

In addition to the stock cars, the car department is turning out two freight cars of other kinds each month and a mail or baggage car every two weeks; it is also making 160 light and 70 heavy freight car repairs a day.

The new construction includes 60 steel underframe cabooses, being built for the Chicago, Milwaukee & St. Paul of Washington. They need steel underframes because of the pusher service on the mountain divisions on which they will run; for the same reason they are made as compact as possible, being only 24 ft. long over body end sills, 6 ft. less than the present standard of the Chicago, Milwaukee & St. Paul. They have all of the accommodations of the larger cars, including five bunks, two of which are under the cupola.



Ralston Caboose Car Underframe; Chicago, Milwaukee & St. Paul.

The steel underframe is built by the Ralston Steel Car Co., Columbus, Ohio. Drawings of it are shown herewith. The center sills are 12-in. channels with a ¼-in. cover plate the full length on top and between bolsters on the bottom. The side sills are 6-in. x 4-in. x ⅜-in. angles, the body end sills 6-in. channels and the platform end sills 10-in. channels. The latter are braced from the body end sills by 6-in. channels on each side, 2 ft. 8 in. from the center line of the car. The braces are thus at the top of the steps. The needle beams and bolsters are built up, as shown in the drawings, the top plate of each passing through the center sill webs.

J. J. Hennessey is Master Car Builder at West Milwaukee, and to him we are indebted for the foregoing information.

THE LEGAL, ECONOMIC AND ACCOUNTING PRINCIPLES INVOLVED IN THE JUDICIAL DETERMINATION OF RAILROAD PASSENGER RATES.*

BY MAURICE H. ROBINSON,
Professor of Industry and Transportation at the University of Illinois.

(*Continued.*)

The right of the legislature to fix rates is, however, not absolute, as was held in the earlier decisions. It is limited by all the provisions of the federal Constitution,[30] which are intended to protect property rights as well as those which establish due process of law as the law of the land. The full meaning of these constitutional provisions as they have been developed through a series of decisions by the supreme court constitute one of the most remarkable chapters in recent legal history.[31] When the supreme court in 1876 rendered its first decision sustaining the power of a state legislature to regulate and fix railroad rates, it held that the power was complete and exclusive and independent of review by the courts. "Where property has been clothed with a public interest," said the court in Munn vs. Illinois, "the legislature may fix a limit to that which shall in law be reasonable for its use. This limit binds the courts as well as the people. If it has been improperly fixed, the legislature not the courts must be appealed to for the change."[32] The first indication of a change of opinion is found in the *obiter dictum* of Chief Justice Waite in the Railroad Commission cases decided ten years later, in 1886. While upholding the power of the legislatures to fix reasonable rates, the chief justice said: "Under the pretense of regulating fares and freight, the state cannot require a railroad corporation to carry persons or property without reward; neither can it do that which in law amounts to a taking of private property for public use without just compensation or without due process of law."[33]

According to the dictum of Chief Justice Waite, state legislatures may regulate railroad rates only so far as may be done without confiscating the property of the company. Provided the rates fixed are not so low as to prevent the railroad company from maintaining its property intact and unimpaired in condition after paying its operating expenses, the acts of a state legislature will be upheld by the federal courts, but not otherwise.

A second modification of the original doctrine was introduced in 1888 by Justice Brewer, then of the circuit court, who, after citing Chief Justice Waite's dictum mentioned above, granted the application of the Chicago & North-Western Railway Company for an injunction restraining the Iowa Railroad Commission from enforcing certain rates fixed by the legislature on the ground that "the right of judicial interference exists only when the schedule of rates established will fail to secure to the owners of the property some compensation or income from the investment. As to the amount of such compensation, if some compensation or reward is in fact secured, the legislature is the sole judge. The question is one alone of policy. * * * Where the proposed rates will give some compensation, however small, to the owners of railroad property, the courts have no power to interfere. Appeal must then be made to the legislature and to the people."[34]

Still a third and final modification of the railroad rate law through judicial decision was handed down in 1890 in the case of the Chicago, Milwaukee & St. Paul Railway Company vs. Minnesota, where it was definitely decided by a majority of the Supreme Court of the United States that the rates fixed by a legislature or by a commission acting under its authority must not only permit some compensation in addition to operating expenses and maintenance of property, but also that the amount of such compensation must be determined by a court of competent jurisdiction, which alone is able to guarantee to the railroad companies due process of law and the equal protection of the laws. In the course of the decision the court said: "If the company is deprived of its power of charging rates for the use of its property, and such deprivation takes place in the absence of an investigation by judicial machinery, it is deprived of the lawful use of its property and thus in substance and effect of the property itself without due process of law, and in so far as it is thus deprived, while other persons are permitted to receive reasonable profits upon their invested capital, the company is deprived of the equal protection of the laws."[35]

Since 1890 the supreme law of the land as interpreted in the St. Paul Railway case, has not been changed in its essential principles. Through the development of this doctrine it has come to pass that while the railroad companies are subject to public regulation, and while legislatures and commissions may fix railroad rates, nevertheless the railroad corporations are fully protected by all the provisions of the fourteenth amendment to the Constitution of the United States as interpreted by the courts. Consequently the two following propositions may be laid down as the legal principles under which railroad rates may be fixed by public authorities.

1. Under the guise of regulating and fixing rates and fares, railroad corporations cannot legally be deprived of property without due process of law or without just compensation; due process of law is held to mean investigation by judicial machinery; and just compensation, the liberty to fix rates such that the expenses may be paid and the property be maintained; and

2. Railroad companies cannot be denied by legislatures or commissions the equal protection of the laws. They must therefore be allowed to charge rates and fares such that the property will return a reasonable income, that is, an income that is fairly comparable, considering the risk involved, with the return that is generally earned by property devoted to other uses.[36]

III.

The problem which the courts have assumed as a result of their later interpretation of the property clause of the fourteenth amendment is one of the most complicated and intricate that the sister sciences of economics and accountancy afford.

The economic principles involved are fairly simple. Transportation as one of the co-ordinate branches of the general industrial activities of the country, ought to be independent and self-supporting. Those who make use of its services may properly be called upon to render compensation sufficient in amount to pay the legitimate operating expenses, to provide for the ordinary wear and tear of the property and to return to the owners profits that are fairly commensurate with those that are received in other lines of industry. Moreover, the economic costs of transportation above enumerated in broad outline should be distributed among the beneficiaries in a fairly equitable manner;[37] that is, either in proportion to the costs actually incurred in their behalf, or to the value of the services rendered to particular groups of patrons,[38] or to the individuals within those groups. This is the fundamental economic principle underlying all legislation against discrimination between persons, places and commodities. Its application to particular cases has in the past constituted the

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[30] Constitution U. S., Fourteenth Amendment, Section 1.

[31] See Smalley, Railroad Rate Control, for a full description of the development of the doctrine of judicial review.

[32] 94 U. S., 178.

[33] Stone vs. Farmers' Loan & Trust Co., etc., 116 U. S., 307, 331.

[34] Chicago & North-Western Ry. Co. vs. Dey, 35 Fed. Reporter, 878.

[35] Chicago, Milwaukee & St. Paul Ry. Co. vs. Minn., 134 U. S., 458.

[36] Since the Fifth Amendment to the National constitution guarantees essentially the same property rights to persons against the acts of the Federal government, it, of course, follows that the courts will grant equal protection to the railroad companies in the case of the reduction on interstate rates by the Interstate Commerce Commission acting under the authority of the Hepburn amendment to the Interstate Commerce Act of 1887.

[37] Rates made by railroad companies generally fail to give that nice adjustment to service rendered that is characteristic of the other industries, owing partly to the difficulties of determining costs and partly to the unequal operation of the competitive forces.

[38] As for example, a state or a city, or a mining district.

chief work of the Interstate Commerce Commission so far as that body has undertaken to exercise its functions in the regulation of rates. A further application of the same economic principle is found in the statement that freight, passenger, mail and express rates should be so adjusted that each department of the service is able, after paying its share of the joint expenses, to contribute an equitable portion of the interest and profits to which the owners may justly be entitled. The courts as the final arbitrators of the above principles ought to condemn as uneconomic, as well as unconstitutional under our government, rates so low as to prevent a normal rate of return upon the value of the invested capital; and, secondly, rates upon any particular kind of traffic, freight, passengers, mail or express, that do not allow that particular service to contribute its proper proportion to the common treasury.

From the standpoint of accountancy the problem is less simple. This is due partly to the difficulties inherent in the fundamental conditions of the railroad service, and partly to complications introduced by our dual system of government control.

In its simplest form, that is, where the control is vested exclusively in the hands of the central government, the accounting problem consists primarily in determining the following factors: first, the gross earnings of the railroad company; second, its operating expenses; third, the value of its capital investment, and fourth, the normal rate of return received from investment in other lines of industry. Given these items, the question is, Will the rates fixed by a legislative act permit of gross earnings at least equal to the operating expenses plus an equitable rate of interest and profits upon the investment?

Ordinarily the entire earnings of a railroad company are derived from conducting transportation, and therefore, gross earnings is synonymous with the entire income. Even in those cases where a railroad company is the owner of a coal mine, or a manufacturing plant, or of income-bearing securities, there is little difficulty in accurately separating the receipts from such outside investments from those derived from the transportation of persons and commodities. Hence, in all cases, the determination of gross earnings is fairly simple.

The chief difficulty arises in the determination of the operating expenses. Every railroad company is constantly expending money for two purposes, quite distinct in theory but well nigh inseparable in practice. The first of these two purposes is for current expenses, including the cost of operation and the ordinary repairs to roadway, buildings and equipment. The second is for the purpose of making improvements and extensions. Railroads are constantly tearing down old stations and erecting better ones in their places; substituting new and heavier rails for lighter and partially worn ones; building steel or concrete bridges in place of wooden structures; discarding old cars and locomotives and replacing them with cars of larger capacity and locomotives of greater motive power. Theoretically, expenditures for current expenses end with the last dollar's worth that it is necessary to expend on repairs in order that all the property of the railroad be kept up to the standard of yesterday. Practically, however, repairs and improvements are constantly being made together and no exact line of demarkation can be drawn to show where repairs end and improvement begins. Theoretically speaking, again, any expenditure is held to be an improvement which reduces operating expenses or increases the earnings. Practically, again, so many other changes are occurring at the same time with the expenditure in question that it is usually quite impossible to tell just how the net earnings are affected. The same principle applies in the case of a railroad company that fails to make the expenditures necessary to keep its track and equipment up to the regular standard. Under such conditions, so long as the traffic can be handled fairly economically the expense account will be low and the profits proportionally heavy. On the other hand, a railroad that is continually making even slight improvements out of its earnings will show for the time being large operating expenses and small profits. In neither case are the true expenses of operation shown, and consequently in all such cases the proper adjustments must first be made before the net earnings shown by the books may properly be accepted by any court as a basis upon which to determine the constitutionality of any rate fixed by the public authorities.

The actual investment of a railroad company would be found in connection with the determination of operating expenses and repairs provided all expenditures were wisely made and the cost of construction remained constant from the first inception of the railroad. Under such conditions, the total expenditures less the total operating expenses, including repairs, would necessarily be equal to the capital investment. Since, however, no railroad company has shown that fine discrimination in separating its expenditures for these two purposes that is indispensable where capital is to be determined in this way, and again since there is usually an appreciable portion of the expenditures on account of capital that are unwisely if not fraudulently made, and, furthermore, since the cost of materials and labor is sure to have appreciated or depreciated after the investment was made, it has been found desirable to make certain adjustments to compensate for the foregoing errors. Such adjustments, however, involve the actual examination of all the vouchers and the separation of expenses from investments from the beginning of the railroad's existence to the date of investigation. This process is impossible in some cases, impracticable in most others, and expensive in all. Consequently, the usual method adopted is to find the value of the investment through an inventory. The cost of new equipment similar to that owned by any particular railroad is readily determined owing to the fact that such equipment has a well-known market value. The life of cars and locomotives are found from experience and hence a scale of depreciation can readily be made. With these facts determined, the value of the equipment of any railroad is easily calculated. The cost of construction of the permanent way, yards, stations and terminals, etc., can be estimated by experts in railroad construction with a reasonable degree of accuracy. The value of the land upon which the road and buildings are located is more difficult of estimation. Still, if the ordinary principles of real estate valuation are applied and consequently railroad real estate is valued at the same rate as that in its immediate vicinity, the valuation can be made with sufficient accuracy for the purposes in view.

The fourth element in the problem, the determination of the average rate of return in other lines of industry, is under present conditions largely a matter of personal judgment. Possibly the data exist upon which the question might be scientifically answered. But certainly no attempt has ever been made to determine even the average rate of return in all other lines, and, moreover, the data are so scattered and fragmentary that such a problem is not likely to be seriously considered. Hence the judgment of the courts as to what constitutes a proper rate of return must be accepted at the present time in lieu of a more scientific method of determining the rate of return to be used in the accounting.

A second step in the solution of the accounting problem consists in the allocation or apportionment of three of the above items, viz., earnings, expenses, and capital, between the freight and passenger departments.[39]

The earnings, coming as they do from distinct sources, need only to be kept separate and each credited to its proper department.

Expenses, on the other hand, are partly separate and partly common. The two departments use a common right of way, roadbed, rails, bridges, water tanks, car sheds and roundhouses, and sometimes depots. A part of the administrative expense and all of the taxes are for the common benefit. In order, therefore, to determine the net earnings from either

[39] A complete solution of the problem would involve a further separation of passenger earnings, and expenses among the three branches, carriage of persons, mail and express.

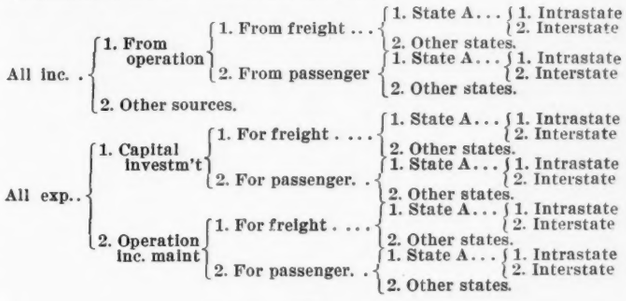
the freight or the passenger departments, it is necessary to prorate all joint expenses between the two branches of the service in some arbitrary way. If the method chosen should by any chance allocate too large a share of the joint expenses to the passenger department, that service might show a deficit, but not, of course, without making the freight department seem proportionally more profitable. Hence the method of division adopted for the separation of the common expenses between the two departments is likely to determine whether either the freight or the passenger rates are so high as to be extortionate or so low as to be unconstitutional.

In the case of the capital investment, a considerable portion may be assigned to the freight and to the passenger departments when the expenditures are made or when the inventory is taken, according as the one or the other method of determining the investment is adopted. This would include freight equipment, freight houses, yards, and terminal facilities for the freight service, and passenger equipment, stations and yards for the passenger service. The investment in main track and sidings, together with the bridges, must necessarily be allocated to the two departments in some arbitrary manner, and here again the method of division is likely to determine the question at issue.

Under our system of government, that of semi-independent states united for certain specific purposes into a federal union, two further divisions of earnings, expenses and capital investment become necessary.

First. A state government has no authority outside its own borders. Consequently, since most railroads extend across several states, a division of earnings, expenses, and capital by states must in such cases be made. This division is required by most of the railroad and tax commissions, and is therefore made regularly by all railroads lying in two or more states, but usually in a very unscientific way. A considerable portion of the expenses are incurred wholly within the boundaries of particular states. The remaining expenses are made for train service between two or more states, advertising and general office expenses, all of which must be prorated to the several states over which the service is spread. The case of earnings is quite similar. The division of capital is somewhat more complicated, for while even a larger proportion of the investment may be localized, the proper method of allocating the cost of terminals involves questions quite impossible of solution by mathematical principles. The Stuyvesant Docks of the Illinois Central at New Orleans, for example, are located geographically in the State of Louisiana. From the economic standpoint, however, these docks are a part of the Illinois Central in Illinois and Iowa. Similarly the Chicago terminals of the Chicago and North-Western Railway and other similarly located roads, while situated in Illinois by an arbitrary division of the territory into states, are used impartially for the benefit of the traffic of the whole line. The allocation of the investment in the great terminals among the branches of the road and between the freight and the passenger service, while not necessary where the railroads make their own rates, becomes of the utmost importance where the courts undertake to determine the validity of state rates on the basis of the cost of the service.

Second. The National constitution grants to the Federal government the right to exercise control over interstate commerce. Federal statutes passed under the authority of the interstate commerce clause give the exclusive control of the interstate traffic of the railroads of the country to the Interstate Commerce Commission subject to review by the United States courts. A state legislature has, therefore, no power or authority over traffic which is conducted only partially within its boundaries. Since it has no jurisdiction over such traffic, the earnings and expenses connected with it may not be legally considered in determining the validity of a rate established by state authorities. Hence the earnings derived from the interstate traffic must be separated from the earnings apportioned to the state for both the freight and the passenger service. Similarly, expenses incurred on account of the interstate traffic must also be separated from the total expenses for the state, for both freight and passenger traffic, in order to determine the expenses of the business over which the state authorities have control. And finally the capital investment for the whole state, which has already been allotted to the freight and passenger departments, must further be divided between the interstate and intrastate freight and passenger service. The complexity of the problem which has thus been briefly outlined may be better appreciated from the following diagram:



IV.

The principles governing the separation of expenditures between capital and expenses have already been stated. Any expenditure which will permanently increase earnings or decrease expenses may properly be charged to capital. All other expenditures should be charged to expenses. The actual separation under ideal conditions would be entrusted to a committee of experts representing (1) those having charge of the work at the time the expenditure was made, (2) those having charge of the operation of trains, (3) those having charge of the traffic, and (4) those having charge of the accounts. Such a committee with its combined knowledge and judgment would be able in most cases to make a reasonably fair apportionment of expenditures between the two classes. In actual practice, however, the separation is made by a subordinate official or clerk who has some knowledge of the character of the outlay, but in most cases has little or no appreciation of the effects upon earnings and expenses. In some cases, moreover, those having charge of the separation are directed by the management to charge somewhat more or somewhat less to expenses than actually belong to that account. In most cases, it is safe to say, the vouchers do not give sufficient information upon which to make a correct division. In many cases the vouchers are destroyed after being preserved for a few years, in other cases they are lost. If, therefore, an improper division of expenditures has been made in the past by any railroad company whose rates are in process of judicial determination, it is clearly impracticable, if not impossible in most cases, to correct the accounts by making a redivision of expenditures under the direction of the courts. If too little has been charged to expenses in the past, the capital account will be inflated beyond its just proportions; if now that rates are likely to be reduced by legislative act the railroad company reverses its former policy and charges a portion of its improvements to expenses, it will have an inflated capital account upon which it is claiming the constitutional right of paying in interest and dividends a rate of return commensurate with that which is being earned in other lines of industry, and at the same time it will have contracted net earnings from operation out of which the return upon capital must be paid. Such a state of the accounts, while perhaps exceptional, is yet common enough to deserve attention. The courts being obliged to base their decisions upon facts are under the necessity of using the results of the division of expenditures already made, since it is impracticable to make a redivision for reasons already stated, if they use the

facts at all. They consequently find themselves face to face with the following dilemma: if they disregard the statistical results presented by the accounting department of the railroad company and base their decision upon social and economic conditions in a general way, they fail to conform to the provisions of the fourteenth amendment as interpreted in the later cases arising under it; if, on the other hand, they base their decisions on the accounts of the company, they must do so with the full understanding that these accounts are vitiated by errors of principle as well as of judgment in the application of those principles and therefore have little if any value for the purposes in question. The use of this method of determining capital is, therefore, attended with the gravest dangers from the accounting standpoint; consequently the courts must continue to rely upon the inventory method for the determination of the investment in the future as they have in the past. If the true value of railroad property can be found in this way, a scientific basis for the judicial determination of legislature-made rates, so far as the determination depends upon the allowance of a reasonable rate of return upon the investment, can be secured. If the real value of the property cannot be found in this way, then the judicial determination of rates must continue to be, in the future as in the past, merely a guess.

In the cases where the judicial determination of the validity of rates fixed by state authorities is involved, the second step[40] in the process of accounting usually consists in the apportionment of the earnings and expenses between the state in question and the other states.

Earnings are usually apportioned on the basis of some convenient physical unit, the most common of which is the train mile.[41] The assumption upon which this method rests, viz., that all trains closely approximate a standard type, is contrary to fact. Freight trains vary from the heaviest through express, often containing from sixty to eighty cars of fifty tons capacity to the local freight of twelve to twenty cars of thirty tons capacity. In the passenger service there is apparently more uniformity, but even here the actual variation is so wide as to vitiate the results. In the second place, this method assumes that rates are practically uniform over the whole line, an assumption which is also untrue in the great majority of cases. For purposes of comparison from year to year, allocation of earnings to the several states on the basis of the respective train mileages may give results of some value; but as a criterion upon which the courts may decide whether a given rate is confiscatory or profitable, this method has no claim to scientific accuracy. A better method for the apportionment of earnings to states has come into general use in recent years and was used by the Chicago, Milwaukee & St. Paul Railway Company in the Wisconsin passenger fare case with satisfactory results.[42] By this method the revenue from all intrastate traffic is credited to the state in which the service was performed and the revenues received from all interstate traffic is separated by individual way-bill and ticket in the proportion which the mileage within the particular state bears to the total mileage transported. The sum of the intrastate earnings plus the individual mileage proportion of the interstate receipts gives the gross receipts for the freight and likewise for the passenger business of the state. This system of separation has the advantage that a considerable proportion of the receipts, viz., that from the intrastate traffic, is actual. It has the disadvantage of assuming that rates are made on an equal mileage basis for individual shipments and services. In this respect it is open to criticism. Speaking scientifically, a rate is made up of three elements: first, a terminal charge at point of shipment; second, a mileage charge varying with the estimated cost of transportation; third, a terminal charge at point of receipt, and fourth, wherever possible, some allowance for profit. The revenue arising from a given shipment should be assigned to the terminals and the states through which it is transported in the same way. Suppose, for example, that a person is transported from Chicago to Madison, Wisconsin, a distance of 130 miles, at three cents per mile; and that the state line is equidistant from the two cities. A terminal charge of x cents per unit should be allowed the Chicago terminal, a charge for similar purposes but probably smaller should be credited to Wisconsin for the use of the Madison station privileges and the remainder divided about equally between Illinois and Wisconsin. In the case of a shipment from Milwaukee to Chamberlain, South Dakota, terminal charges should be credited Wisconsin on account of the facilities furnished at Milwaukee, a smaller charge allowed South Dakota for the less elaborate station privileges at Chamberlain, and the remainder prorated to the three states, Wisconsin, Minnesota and South Dakota, not in exact proportion to the mileage hauled in the three states, but in proportion to a mileage weighted[43] in view of the difficulties and cost of the haulage. Such a system of apportionment, while exceedingly difficult of application and exceedingly easy of manipulation for fraudulent purposes, would apportion the revenue to the several states in conformity to the principles of accounting as applied in the best manufacturing establishments.

Under the cruder methods of railroad accounting, expenses are apportioned to the several states on the basis of either revenue train mileage or gross earnings. The latter method is not only unscientific in principle, but is, moreover, from the logical standpoint, a species of begging the question that needs only to be mentioned to be discredited. Apportionment on the basis of revenue train mileage has the advantage of being easy of application and of prorating expenses in some proportion to the costs of the work performed. In its practical application this method may be used to apportion all expenses or only a portion of them. All large railroad companies divide their lines into operating divisions, these operating divisions are also accounting divisions; some companies further divide the operating divisions into subdivisions for accounting purposes.[44] Where an accounting division lies wholly within the boundaries of one state the expenses within that division will, of course, be charged to that state. For those divisions lying in two or more states, the expenses not readily localized are divided in proportion to the respective train mileages made in the several states. If traffic and operating conditions were substantially similar in all the states affected by this method of apportionment, so that in general the train mile represented practically the same unit of work done and of costs incurred, there could be little objection to its use for the purposes in view. But when conditions are dissimilar, that is, where trains in one state are not only heavier but are run at higher speed, this system of apportionment throws a disproportionally large part of the joint expenses upon the state that is conducting its transportation service at a relatively low cost. Having this in mind, the Wisconsin Railroad Commission introduced a variation of this method, namely that of apportioning common expenses on the basis of various units, selecting in each case that one which seemed best suited to the conditions involved. For example, a considerable proportion of the items included in maintenance, especially those caused by the natural depreciation of the property, are divided in proportion to the road mileage, while those items that wear out, such as rails, on the basis of train mileage. Repairs to locomotives and cars which were used in the interstate traffic are apportioned in proportion to locomotive and car mileage respectively in the several states. In cases where no appropriate

[40] Expenses might be apportioned to the freight and the passenger department for the whole road, and then apportioned to the state. The former is the usual practice.

[41] Sometimes road mileage is used because of extreme ease of application. While useful for some purposes, it has no value for the purposes of determining the profitableness of a particular rate.

[42] Wisconsin Maximum Passenger Fare Case, p. 56.

[43] The actual division should be made as nearly as possible in proportion to that which would occur were the railroads entirely separate financially at state boundaries.

[44] Railway Organization and Working, p. 323.

unit seemed available, recourse was had to apportionment on the basis of expenses for the service most nearly related in character.[45]

The system inaugurated by the Wisconsin Railroad Commission demands for its successful application a combination of qualities that are rarely found united in the same person, viz., a thorough knowledge of the nature of the various branches of railroad work, a profound grasp of the principles of economics and accountancy and large experience in the application of these principles to the practical problems of the business world. With these conditions fulfilled, there seems to be no valid reason why expenses may not be apportioned to the several states with sufficient accuracy to serve as the basis for the judicial determination of railroad rates without injustice either to the railroad owners or the traveling public.[46]

Two general methods of dividing the expenses between the freight and passenger departments are coming into general use largely as a result of the passenger fare legislation of the past two years.

(1) The first method is exceedingly simple. It was used by the Pennsylvania Railroad Company in connection with the two-cent fare legislation in Ohio and may best be expressed in the original phraseology:

"A. All known items relating exclusively to the passenger business are charged to passenger expenses.

"B. General expenses, such as cost of maintaining road and roadbed, superintendence, taxes, et cetera, are divided between passenger and freight on each division, in the proportion which passenger train mileage bears to the total passenger and freight train mileage."[47]

In referring to this method President McCrea remarked: "Of course this is arbitrary, but the rule is almost universal and I know of no other basis that has so many arguments in its favor and which seems so absolutely reasonable."[48] What the arguments in its favor are or why it seems so absolutely reasonable he does not state. Obviously the method is exceedingly simple and easy of application. All railroads keep an account of the mileage made by both freight and passenger trains. The proportion which the passenger train mileage bears to the total mileage is, therefore, easily found. The sum of the direct expenses plus the arbitrary proportion assigned to the passenger business on the train mileage basis gives the total passenger expenses.[49] Railroad accounting to be of permanent scientific value must be based upon sound economic principles. One of the most fundamental of these principles is that the price of services can never for any length of time remain below the actual cost to the producer or above the actual value to the consumer. In a state of perfectly free competition where economic friction is reduced to a minimum, prices tend to and ultimately approximate the actual costs of production. In a state of monopoly, on the other hand, the prices charged tend to be so adjusted that net profits are the largest possible with the given demand for the given services. Under ordinary conditions, competition is not quite free, economic friction exists, and often some element of monopoly is present. Prices, therefore, vary between the impassable limits set by the cost of production on the one hand and the value of the services to the marginal consumers on the other, but always tending to gravitate toward the cost of the particular services in question. If we apply these general economic principles to the question that we are now considering, we must conclude that the undistributed expenses ought to be prorated in proportion to the actual cost of the passenger service, or to its value either to the railroad or to the public. If we accept the latter of the three possibilities, we adopt the principles of "charging what the traffic will bear" and the public regulation of railroad rates will necessarily consist of supervising the railroads only so far as is required in order that the railways do not "charge what the traffic will not bear." If, again, the principle of division accepted be that of the value of the services to the railroads, the actual separation will be determined by the gross earnings of the two departments. Gross earnings are, however, determined largely by the rates in force, and the reasonableness of these rates is the question that the courts have undertaken to determine. Such a method of prorating the common expenses is begging the question, and while entirely appropriate for other purposes, cannot logically be accepted as a basis where the decision hangs upon the question "Will the rates return a reasonable income upon the value of the investment?" The third economic criterion then remains, viz., rates based upon the cost of the service, and this is the test the courts have uniformly undertaken to apply. To prorate common expenses in proportion to revenue train mileage is, however, likely to give results entirely out of harmony with each of the accepted economic principles above stated. This method must, therefore, be rejected as unsound in principle and absolutely at variance with the theory of rates that the courts have undertaken to maintain in their later decisions. A hypothetical case will serve to illustrate the inherent fallacy of this method for the purposes in hand. Suppose Railroad A—— charges high passenger rates and low freight rates. This policy will develop a heavy freight traffic and a light passenger business. In the conduct of the freight business, the company exercises great economy of operation, running heavy trains with comparatively few empty cars. The freight train mileage will therefore be small in comparison with the tonnage and with the earnings from freight. The passenger business does not lend itself so readily to such economies of operation. Frequent train service with regular schedules must be maintained, and passenger trains run at high speed are frequently comparatively empty. The passenger revenue will therefore be small, notwithstanding the fact that the rates are high and the passenger train mileage comparatively large. Under these circumstances it is probable that the passenger train mileage may equal if not exceed the freight train mileage, although contributing not over one-fourth of the revenue. Under the system of division adopted by the Pennsylvania Railroad, the passenger service would be charged with at least one-half of the common expenses, and although the rates were high would seem to be conducted at a loss. The use of this method thus might prevent the reduction of rates by the legislatures even where the rates were already so high as to effectively interfere with the ordinary movement of passenger traffic. The results of this system of prorating expenses may be seen in the statement of the Pennsylvania lines west of Pittsburgh, above referred to. Of the thirty-two companies of the Pennsylvania operating in the state of Ohio it was shown that twenty-one suffered a net loss per passenger mile and ten a net loss per train mile under the three-cent fare. These results are evidently due to the adoption of an improper method for the apportionment of the common expenses.

(2) The second method is more complicated and at the same

[45] The cost of the water supply, for example, was apportioned to the State on the basis of fuel consumed. Report, p. 117.

[46] The valuation of the capital investment within a certain state is made directly, when the inventory method is used, with the exception of the valuation of the equipment. This is prorated to the several states in proportion to the road mileage, or to the train mileage, or better still to the locomotive and care mileage respectively.

[47] Statement of the Pennsylvania Lines West of Pittsburgh, p. 2.

[48] *Ibid.*, p. 3.

[49] Let the passenger train mileage be x miles, the freight train mileage y miles and the total mileage $x+y$ miles. $\frac{x}{x+y}$ will then represent the passenger proportion of the joint expenses. Let a represent all known items relating exclusively to the passenger business and b the same items for the freight. Let c equal the total undivided expenses; then $a + \left\{\frac{x}{x+y}\right\} c$ = the passenger expenses and similarly $b + \left\{\frac{y}{x+y}\right\} c$ = the total freight expenses. Let p equal passenger receipts and f equal freight receipts; then $p - \left\{a + \left\{\frac{x}{x+y}\right\} c\right\}$ = excess of passenger earnings over passenger expenses and $f - \left\{b + \left\{\frac{y}{x+y}\right\} c\right\}$ = excess of freight receipts over freight expenses.

time more scientific in principle. It was devised by Thomas F. Woodlock, formerly of the *Wall Street Journal*, and is explained at length in his book entitled "The Anatomy of a Railroad Report."[50] This method of division was constantly referred to in the Wisconsin maximum passenger fare case and seems to have been quite generally followed by the commission in their apportionment of the common expenses, especially between the passenger and freight departments. In general the method actually separates expenses so far as possible both geographically and between the passenger and freight business, and prorates all joint expenses between these two branches in proportion not to one but to many criteria, each of which is considered most equitable for the particular service in question. For this purpose Mr. Woodlock divides expenses as follows:

Class I. Expenditures for the actual production of transportation.[51]

Class II. Expenditures for general direction, clerical work and supervision.[52]

Class III. Expenditures for collecting and handling freight and passengers at stations and terminals, and intermediate points.[53]

Class IV. Expenditures for the maintenance and operation of plant not dependent upon the operation of trains.[54]

A considerable proportion of the items in class I and class III are separately incurred and therefore no arbitrary apportionment is necessary. For the remaining items in these classes and for practically all of classes II and IV arbitrary methods of allocation are necessary. In class I and class IV joint expenses are apportioned on the basis of engine or train mileage, as seems most reasonable, with an allowance for the fact that the direct cost of running a passenger train one mile is on the average considerably less than the same expenses for the freight train mile.[55] For classes II and III Woodlock uses the gross earnings[56] as a basis. These two classes are, however, relatively small, amounting to 15 to 20 per cent. of the total expenditures. For the purposes of the courts some other method of division must necessarily be substituted even though the two classes be relatively small. A considerable proportion of classes I and II are directly separated by the railroad companies; a much larger proportion of these classes might be directly separated, so that it is easily possible to divide at the origin somewhat over one-half of all expenses.[57] The remaining portion is, however, so large that the method of division chosen will, in most cases, determine whether the passenger business is being conducted at an apparent profit or an apparent loss.[58]

The fourth and final step in the apportionment of earnings, expenses, and capital consists in making a proper and equitable division of these items between the intrastate and the interstate business. The separation of the intrastate passenger receipts from the total passenger receipts for the state presents no difficulties of principle, but entails a vast amount of detailed statistical work. It involves the actual separation of all the interstate tickets for the period in question and the addition of the amounts received from the sale of the intrastate tickets for the same time. The separation of the interstate passenger expenses from those for the intrastate business presents very grave difficulties of a theoretical character, but once the method is determined upon it involves comparatively little actual work. The Wisconsin Railroad Commission adopted the gross earnings method with comparatively small consideration of its inherent defects. "If the intrastate passenger traffic amounts to about 39.63 per cent. of the total," it was remarked, "it is also clear that it should be charged with a corresponding proportion of the expenses." Such a conclusion does not necessarily follow. For the intrastate passenger receipts are dependent upon the rates in force. A reduction of rates will, it may be assumed, cause a small increase in traffic and a considerable decrease in receipts, or a considerable increase in the intrastate traffic with practically no change in receipts. Suppose the first alternative results. Since the receipts are less, the intrastate passenger business must, according to this theory, be charged with a smaller proportion of the common expenses; but since more passengers are carried such expenses will not be less but will undoubtedly be more. The effect, therefore, of applying this method in the above case will be to throw more of the passenger expenses upon the interstate business, while a larger proportion of the actual work done will be performed for the intrastate traffic. Suppose the second alternative comes true. Let it be assumed that the intrastate passenger rates are cut from 3 to 2 cents per mile and that an increase of 50 per cent. in this class of the business follows the reduction. The expenses will then be shared in the same proportion as before the reduction although the passenger department is doing an intrastate business one and a half times greater. If the two kinds of service were conducted entirely independently of each other, it is clear that no change would take place in the expenses of the interstate business, while the increase in the intrastate traffic would cause some increase in the expenses of that service. The gross earnings method fails to prorate expenses in porportion to those that would actually be incurred were the two kinds of service conducted on a separate foundation. Its adoption makes one branch a partial parasite on the other and must therefore be condemned as contrary to the fundamental economic principles above stated. Furthermore, as was stated in connection with the discussion of the several methods of apportioning common expenses between the freight and passenger departments, to divide expenses on the basis of gross earnings when the rates which are an important factor in determining the amount of earnings are at issue, involves a fallacy in reasoning that invalidates the results of the process.

The Wisconsin Commission does not suggest any other method nor does this part of the problem seem to have attracted the attention from the courts, commissions, or accountants that its importance deserves. For it will be observed that an incorrect apportionment of joint expenses between the intrastate and the interstate passenger business may have the effect of nullifying the influence of a correct allocation of expenses to the freight and passenger departments. It will also be admitted that when the ability of a railroad company to earn a reasonable return upon its investment is at issue, some method of apportionment based upon

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[50] Pp. 59-121.

[51] Contains all items directly connected with the movement of trains: wages, and salaries of train crews, roundhousemen, switchmen, flagmen, and watchmen, train despatchers, clerks and attendants connected with these services; all kinds of supplies for locomotives, trains and roundhouses; maintenance of rolling stock; the maintenance of way so far as such expense is caused by the movement of trains; losses and damage resulting from the movement of trains.

[52] Contains all the items included in general expenses as prescribed by the I. C. C. classification together with certain items connected with the traffic department that are largely independent of the direct movement of trains.

[53] Includes the wages of station agents, station supplies, tickets and tariffs; advertising and commissions; loss and damage not resulting from train movement; literage and marine equipment; stockyards and elevators; and switching charges.

[54] Includes all items connected with maintenance of way that are not directly caused by the operation of trains; a large proportion of repairs to roadway, track, ties, fences, bridges, telegraph, shops, machinery and workcars; insurance; and expenses of clerical work connected with the above.

[55] The freight engine mile is charged with 10 per cent. more than the passenger engine mile, and the freight train mile with 20 per cent. more than the passenger train mile. Switching mileage is treated as practically all freight engine mileage.—Woodlock, "Anatomy of a Railroad Report," p. 88.

[56] Mr. Woodlock remarks that this method is as good as any other for the purposes of comparison, and adds: "Of course, it is only for such purposes that there is any need of division at all." (Pp. 89, 90.) It will be noticed that Woodlock is here speaking wholly from the railroad standpoint and is not considering the question that the courts have to solve, that is, whether a rate fixed by a legislature or commission is illegal under the fourteenth amendment.

[57] Prof. B. H. Meyer, of the Wisconsin Railroad Commission, in an address before the National Association of Railroad Commissioners, October, 1907, expressed the opinion that only about 55 per cent. of the total expenses may be actually separated between the freight and passenger departments.

[58] Attorney-General Hadley of Missouri, is quoted as stating that the trial of the 2-cent. rate in that state is proving compensatory owing partially to the fact that the railroads, in order to prove certain reductions in freight rates were too large, had allocated too large a proportion of the joint expenses to the freight business and could not easily change the method now that the shoe was pinching the other foot.—*Chicago Tribune*, September 27, 1907.

the cost rather than the earnings of the work done must be selected. In this case, fortunately, such a method may be chosen and easily applied. The unit of passenger service as well as of passenger earnings is the passenger mile. The total number of passenger miles made within the state is easily ascertained by any railroad company or by any competent railroad commission. It is not difficult to separate the intrastate from the interstate passenger mileage. This having been done, all common expenses may readily be apportioned to the two branches of the passenger service in proportion to the intrastate and the interstate passenger miles. Two difficulties are encountered in the application of this method: the determination of a proper allowance (1) for terminal expenses, and (2) for the difference in cost of carrying the interstate and intrastate traffic. Both of these questions are discussed by the Wisconsin Railroad Commission. In the first case no definite conclusion is reached; in the second it is assumed without any investigation that intrastate traffic probably costs about 10 per cent. more per passenger mile than the interstate business.

If the service rendered by the passenger departments were uniform in character, that is, if the terminal service were approximately uniform, if the journeys were of equal length, and if the train service substantially similar, the passenger trip would become the standard unit of passenger expense. Such, however, are not the actual conditions. Expensive terminal stations are maintained in Chicago, for example, partially for the use of patrons who are traveling through the state of Wisconsin on their way from the East to the Northwest. Other travelers are at the same time taking exactly the same journey through Wisconsin but entering the train at some small station between Chicago and the Wisconsin state line, and terminating their journey at another small station just over the Minnesota line, but before reaching Minneapolis or St. Paul. It is, of course, possible that the terminal expense per passenger is no more for the Chicago terminal than for the small country stations; if such a condition be true it indicates that the former is more fully utilized than the latter. It is, therefore, safe to assume that generally terminal service for through passengers costs more than for the local passengers. Moreover, a considerable portion of the interstate traffic begins within the state and ends outside the state limits or the reverse, thus entailing only one terminal expense upon the passenger business of this character within the state; while the intrastate traffic originating and terminating within the state always entails a double terminal service, one at each end of the trip. The above description of the conditions under which terminal expenses are incurred shows the nature of the difficulties that may arise when the total passenger expenses are to be separated on the basis of service rendered by the passenger department to individual patrons. Such service includes the use of terminals plus actual transportation. The terminal service is not generally uniform in character although in cases it may be identical for the two classes of traffic. It is, however, possible to keep account of the number of passengers using each terminal and of the kind of service rendered them by the passenger department. Such a process, while expensive, would enable all terminal expenses to be actually separated and assigned to either the interstate or the intrastate business.

(To be continued.)

Japan has a new Minister of Transportation, Baron Schimpei Goto, who at the time of his appointment was General Manager of the South Manchurian Railroad (that is, the part of the railroad from Port Arthur northeastward which remains in Japanese hands since the war). But he was originally a physician, and served as head of a hospital, and in the general government as chief of the sanitary service; but after the Russian war he was made chief of the civil administration of the island of Formosa, where he distinguished himself, was ennobled, and was given charge of the South Manchurian Railroad. This was originally built with the Russian 5-ft. gage. As fast as the Japanese got possession of it during the war they changed it to the Japanese narrow-gage, to fit their rolling stock; but since the war they have changed it again, but not to the Russian gage, which would permit the Siberian Railroad trains to run through to Port Arthur, as before the war, but to the 4-ft. 8½-in. gage, which is that of the Chinese railroads.

REGULATIONS FOR CANADIAN RAILROADS.

Regulations as to trains, cars, engines and employees were discussed on Tuesday, October 6, by the Canadian Board of Railway Commissioners, the discussion taking up all the morning session. Practically every railroad was represented either by officers or by counsel. The proposed regulations have practically all been concurred in by the railroads at a meeting recently held in Ottawa, at which were representatives of the Canadian Pacific, Grand Trunk, Canadian Northern, Michigan Central and New York & Ottawa; and the regulations in the main were approved. These regulations were sent to all railroad companies in Canada on September 16. They provide as follows:

Every freight car built after December 1 shall be equipped with air brakes and with operating [uncoupling?] levers on both sides of the end.

No freight train shall be allowed to proceed on its journey unless three-quarters of the cars comprising it have air brakes.

The number of cars to a train shall be left to the judgment of officials, but in the case of a double-header the leading engine shall control the train.

Regulations are also made for foot boards, etc., on engines.

On the main lines no light engine shall be run more than 25 miles in one direction without a conductor, in addition to the engineer and fireman. On branch lines the operating officials shall determine the need of conductors on light engines.

Passenger trains shall carry at least one brakeman of not less than one year's experience as brakeman and shall also carry a baggageman provided that passenger trains of eight or more cars shall have at least one additional brakeman.

Locomotive engineers must have at least one year's continuous experience as a fireman, pass a satisfactory examination as to handling engines, brakes, etc., and undergo an eye and ear test.

Conductors must have one year's experience as brakeman and be 21 years of age.

Telegraph operators must be at least 18 years of age, able to write a legible hand, to send and receive at least twenty words a minute, and to pass an examination upon train rules and the working of telegraph offices.

Every employee must undergo a color [vision] test.

The companies must conform to the rules and regulations of the Master Car Builders' Association governing the loading of heavy materials. No material shall be carried on top of a car.

Crippled cars shall not be allowed behind the van on freight trains. Cars containing live stock of perishable freight when crippled in minor respects shall be chained up ahead of the car and taken to the first terminal for repairs when it is safe to haul such cars. In no case are more than two such cars to be handled in any one train except where the cars have been disabled by a wreck and a special pick up train has been sent out to bring them in.

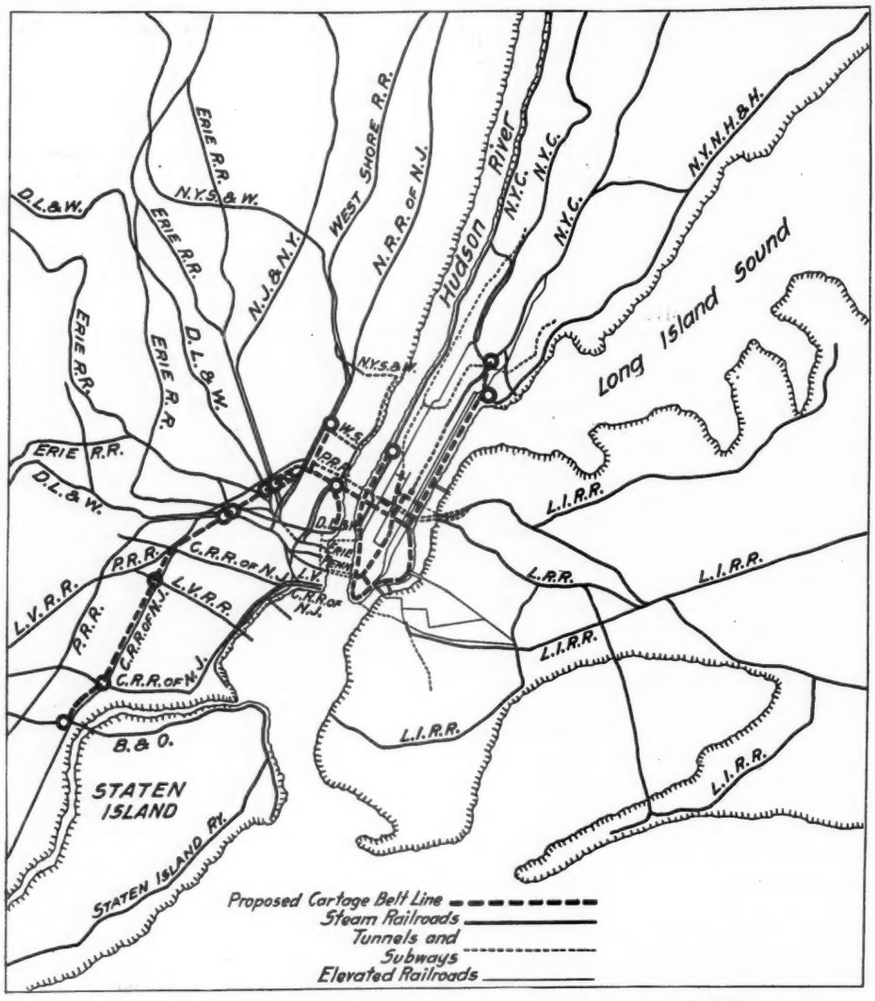
A crippled car shall include one with any of the following defects: Broken coupler, disabled coupler, cracked wheel, chipped flange over 2½ inches, broken wheel flange, bent axle or journal, broken arch bar or truck steps.

Railroad companies or their officers, agents or employees, or any of them, disobeying or failing to comply with the provisions of the regulations shall be liable to a penalty of $50 for each offense.

PROPOSED NEW FREIGHT SUBWAY; NEW YORK CITY AND PORT.

BY WILLIAM J. WILGUS,
President, The Amsterdam Corporation.

While much has been written during the past 40 years on the general subject of freight transportation in the city and port of New York, but little effective thought appears to have been given to the broad question of the more expeditious and economical handling of freight between the carrier and the consumer. Passenger transportation systems have been steadily improved, but the most archaic and inadequate methods of freight distribution still retard the growth of the commerce of New York and make increasingly difficult and expensive the furnishing of food and raiment to the vast population residing on Manhattan island.



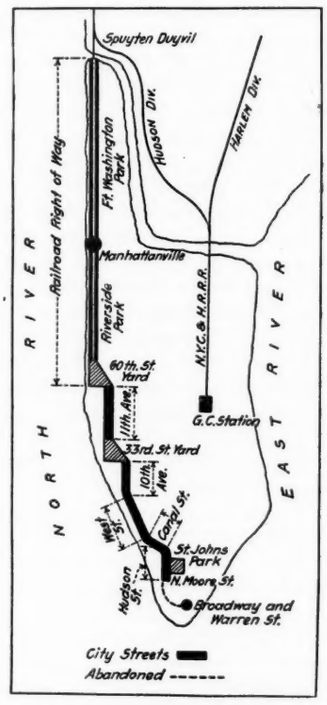
Proposed Cartage Belt Line for New York City and Vicinity.

Recently the attention of the public has been attracted to the freight problem on Manhattan island by the controversy that has arisen over the proposed removal from streets and public places of the tracks of the only railroad that now has direct rail access to the island.

To arbitrarily remove these tracks belonging to the New York Central & Hudson River Railroad Company, and extending on the west side from Spuyten Duyvil to St. Johns Park, will solve the question so far as the safety of the public is concerned, but the difficulties of freight distribution and the resultant evil effects on the commerce of the port will be intensified.

For instance, the abolition of the terminals of the N. Y. C. & H. R. R. at St. Johns Park, Thirty-third street and elsewhere on the west side will necessitate the securing by the railroad of equivalent waterfront facilities for handling annually the 5,000,000 tons of freight that now enter the island by rail at Spuyten Duyvil, and will seriously injure many business enterprises that are important to the welfare and prosperity of the city. This increased use of waterfront space is diametrically opposed to the policy laid down by the New York Commerce Commission in 1900, and by the Chamber of Commerce, that more rather than less dock and pier space is urgently required for the use of water carriers, if the port of New York is to successfully compete with its rivals.

Therefore, the solution of the freight problem on Manhattan island is herein approached with the object of securing the benefits of rail connection, not only with the N. Y. C. & H. R. R. R., but also with all other railroads now terminating on the New Jersey side of the North river and in the Borough of the Bronx, with the need for less rather than more railroad facilities on the waterfront where additional space is demanded for the growing traffic of the water carriers, and with improved methods of distribution that will lessen the time of delivery, largely reduce the high terminal charges with which the port is now burdened, and relieve the harbor and the surface of the city streets from congestion.



The New York Central's Freight Lines in New York City.

The subject is treated under the following headings:

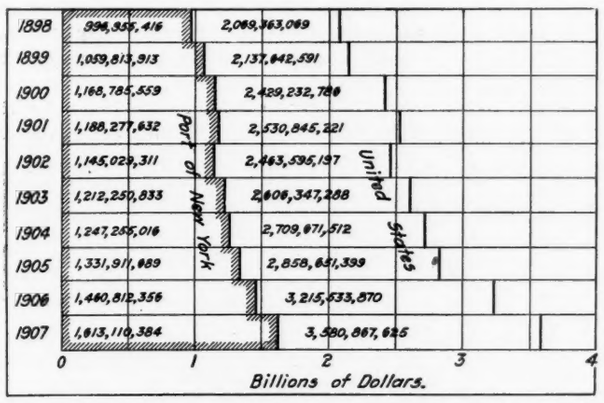
I.—Commercial Importance of New York.
II.—The West Side Problem.
III.—Previous Reports on Waterfront Transportation Facilities of New York.
IV.—Requirements of Commerce.
V.—Requirements of the Public.
VI.—Requirements of the Carriers.
VII.—Proposed Solution of the Problem.
VIII.—Conclusions.

COMMERCIAL IMPORTANCE OF NEW YORK.

The city of New York, with 5 per cent. of the nation's population, produces 11 per cent. of the manufactured products, and acts as the gateway through which flows nearly one-half of the foreign commerce of the entire country.

In 1907 the total imports and exports of the United States were valued at nearly $3,600,000,000, of which over 13,000,000 tons passed through this port, valued at $1,600,000,000.

In manufactures New York ranks first among American



Comparison of the Total Foreign Commerce of the United States and of the Port of New York.

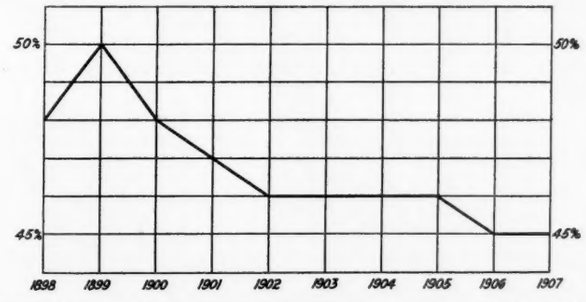
cities, with nearly a half million wage earners, representing a dependant population of 2½ million people, with nearly 40,000 establishments, capitalized at nearly a billion dollars, spending annually for wages nearly a quarter of a billion dollars, and with an annual production valued at nearly $1,400,000,000.

COMPARATIVE MANUFACTURING STATISTICS FROM U. S. CENSUS REPORTS.

	1880			1890				1900			
	United States.	City of New York.	P.c. of U.S.	United States.	P.c. inc. over 1880.	City of New York.	P. c. inc. over 1880	P.c. of U.S.	United States.	P. c. inc. over 1890.	City of New York.	P. c. inc. over 1890	P. c. of U.S.
No. of establishments	253,852	16,923	7	355,405	40	37,163	119	10	512,276	44	39,776	7	8
Capital	2,790,272,606	251,223,975	9	6,525,050,759	134	622,982,074	187	9	9,831,486,500	51	921,876,081	48	9
No. of wage-earners	2,732,595	275,920	10	4,251,535	56	415,552	51	10	5,314,539	25	462,763	11	9
Wages	947,953,795	120,626,680	13	1,891,209,696	100	236,250,857	96	13	2,327,295,545	23	245,021,881	4	11
Cost of material used	3,396,823,549	423,356,534	12	5,162,013,878	52	538,596,570	27	10	7,346,358,979	42	709,109,412	32	10
Value of product	5,369,519,191	659,205,230	12	9,372,378,843	75	1,084,850,236	64	12	13,010,036,514	33	1,371,358,468	26	11

A still further illustration of the importance of New York is the annual tonnage which, according to testimony before the New York Commerce Commission in 1900, exceeds 100,000,000 tons per annum.

Unfortunately, congestion attending the handling of this vast tonnage is causing a gradual decrease of the rate of growth, and the necessity is faced of improving transportation



Proportion of the Foreign Commerce of the United States Handled at Port of New York.

facilities if the city is to continue to hold its pre-eminence as the commercial metropolis of the country. For instance, in 1899, the foreign commerce of the port of New York was 50 per cent. of the total for the United States, whereas, last year it was but 45 per cent.

In manufactures the ratio has fallen for wages from 13 per cent. of the total for the nation in 1880 to 11 per cent. in 1897, and for value of production from 12 per cent. to 11 per cent.

From this data the conclusion may be drawn that, coupled with the great volume of remunerative traffic that is offered to any improved method of freight transit, is the surety of cordial support from the municipality, the shippers and the carriers, of any plan that, by expediting and reducing the cost of delivery of freight, will check the decline in the rate of the city's material growth.

THE WEST SIDE PROBLEM.

The Hudson River Railroad Company was incorporated by chapter 216 of the laws of 1846, and was consolidated with the New York Central Company in 1869 to form the New York Central & Hudson River Railroad Company. By an ordinance dated May 6, 1847, and confirmed by a contract dated August 12, 1847, the company was authorized to build a double-track railroad from Spuyten Duyvil at the northerly limit of Manhattan island, along the company's own right-of-way on the easterly bank of the Hudson river to the so-called "Sixtieth street yard," intersecting some 19 city streets at grade; and thence along and upon the surface of Eleventh avenue, Tenth avenue and West street to Canal street.

Subsequently by ordinances dated September 25, 1849, and December 20, 1864, authority was granted for extensions of the main line from the aforesaid terminus at Canal street, through Canal and Hudson streets to Chambers street, and thence for the use of "city cars" through College place and Warren street to Broadway.

At a later date the tracks were removed from the former terminus at Broadway to the existing southerly terminus at North Moore street in the neighborhood of St. Johns Park.

The double-track main line of the N. Y. C. & H. R. R. R. on the west side of Manhattan island therefore now extends for a distance of approximately 12 miles (eight miles of which are on the company's own right-of-way and four miles in and along city streets), from Spuyten Duyvil to North Moore street, as illustrated on the accompanying sketch. Within this territory there are four large freight terminals, Manhattanville, Sixtieth street yard, Thirty-third street yard and St. Johns Park, in which is handled the large tonnage originating on the 50,000 miles of territory served by the New York Central Lines, destined for local consumption and export at Manhattan island.

The public opposition to a continuation of the presence of the railroad company's tracks on the surface of the city streets, more particularly Eleventh avenue, culminated in the enactment of the so-called "Saxe Law" (Chapter 109, laws of 1906), which provided that the Board of Rapid Transit Commissioners, later succeeded by the Public Service Commission, should agree with the railroad company on the depression of tracks into subways in and across all streets, parks and public places from Spuyten Duyvil to the terminus near St. Johns Park, and in default of so agreeing should condemn the property and rights of the railroad company within the limits thereof.

On November 14, 1906, the Chief Engineer of the Board of Rapid Transit Commissioners reported that instead of placing tracks in a subway between Spuyten Duyvil and Sixtieth street yard, it would be preferable to leave them on the present surface, carrying the intersecting streets overhead, except in the neighborhood of Manhattanville, where the tracks should be elevated so that the streets could pass beneath. South of Sixtieth street yard he called attention to the advantage of an elevated structure but confined his proposed method of treatment to a subway because of the restrictions of the Saxe law. His estimates of cost, exclusive of land and additional tracks, were:

Alternate 1, route along 11th and 10th avenues	$30,550,000
Alternate 2, route along marginal way	34,000,000

In the early part of 1907 the Board of Rapid Transit Com-

missioners appointed a committee consisting of the Mayor, Mr. Jesup and Mr. Smith, to negotiate with the railroad company. As a result they reported on February 25, 1907, that the railroad company had agreed to build at its own expense a six-track subway in Eleventh avenue from Thirtieth street to Sixtieth street, and thence northerly along its own right-of-way, widened for a total of six tracks, on substantially the existing grades, with the intersection streets carried overhead, except at Manhattanville, where the elevation of tracks is proposed so as to permit the streets to pass beneath. The sums to be paid to the city by the company for lands required for the widening of the right-of-way for six tracks were to be devoted to the covering of the right-of-way of the company along Riverside and Fort Washington parks, thus concealing objectionable railroad operations and affording the city increased park area in return for the cost of building the covering. Furthermore, the railroad company agreed to abandon the use of steam for its main line freight operations south of Spuyten Duyvil.

South of Thirtieth street negotiations were deferred awaiting a further examination and discussion between the committee and the railroad company.

These agreements, which had the approval of the Board of Rapid Transit Commissioners, conflicted in several instances with the rigid requirements of the Saxe Law, and a bill having the endorsement of both the board and the railroad company was drawn and submitted to the legislature, but failed to pass.

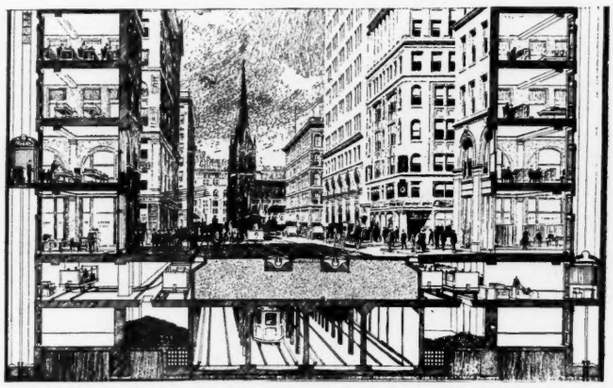
The Public Service Commission, succeeding the Board of Rapid Transit Commissioners in July, 1907, and governed by the mandatory provisions of the Saxe Law, has caused maps to be prepared and referred to the Corporation Counsel with formal directions to commence condemnation proceedings.

The present status of the west side problem is highly injurious to the interests of the city, as no progress is being made to abate the nuisance of tracks at grade; and expensive, slow and uncertain litigation faces the two parties to the problem, the city and the railroad company, who are apparently anxious to reach an amicable agreement.

PREVIOUS REPORTS OF WATERFRONT TRANSPORTATION FACILITIES OF NEW YORK.

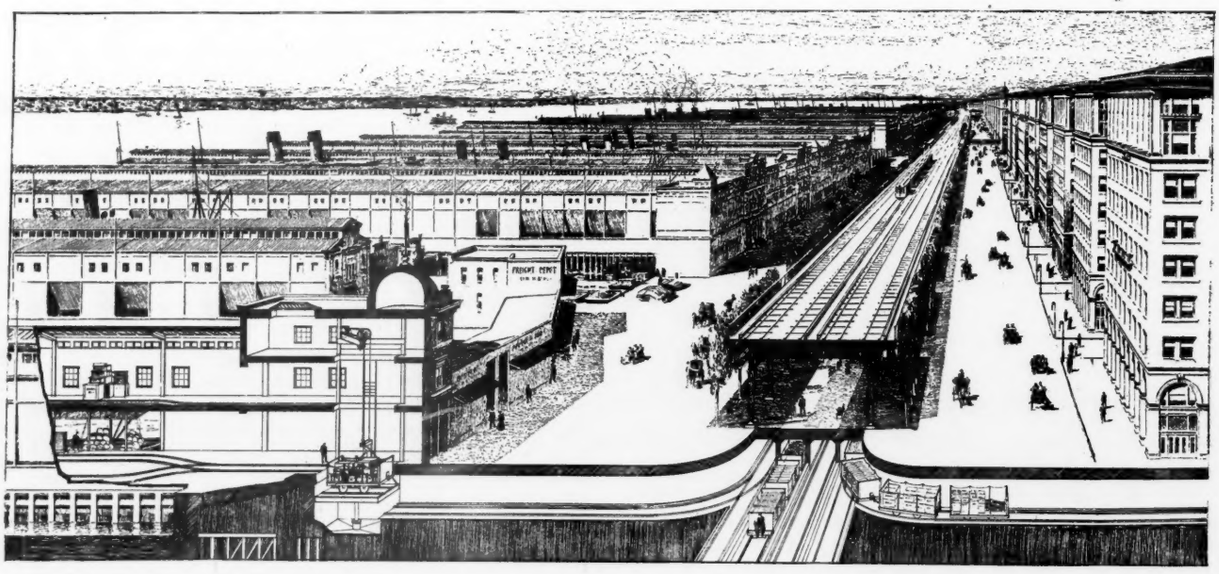
As early as 1867 a four-track railroad on the waterfront was suggested by Wm. C. Bryant, two tracks for passenger purposes and two for freight. Shortly afterwards, W. E. Worthen made a similar suggestion for an elevated railroad in West street from Chambers street to Twenty-third street. In 1874 several members of the American Society of Civil Engineers called attention to the excessive cost of freight transportation on Manhattan island, and recommended the construction of a belt railroad on West street. Between 1874 and 1877 the Committee on Terminal Facilities of the New York Cheap Transportation Association repeatedly cited the high costs of handling freight in the port of New York, and suggested an elevated double-track freight railroad on the waterfront.

However, not until 1895 was official action taken by the city to determine what should be done to improve the methods



Relation of Freight Subway to Passenger Subway.

of freight distribution. In that year the Department of Docks and Ferries appointed a Board of Consulting Engineers, consisting of Geo. S. Morison, Wm. H. Burr and Wm. P. Crahill. This board made several reports, from November 11, 1895, to December 15, 1897, in which an elevated railroad, with access to the piers, was condemned and a four-track surface freight railroad for the common use of all railroads, with a float bridge at the Battery and an elevated passenger railroad were recommended. These recommendations were discussed at length in the *Journal of Commerce and Commercial Bulletin* between February and March, 1898, and were not received favorably by either the public, the commercial bodies of the city nor the railroads, and nothing was done beyond the laying out and partial construction of a wide marginal street along the waterfront with a view to accommodating the surface and elevated tracks as recommended.



Suggested Freight Subway and Elevated Passenger Road in West Street, New York City.

On February 19, 1903, William Barclay Parsons, in his report to the Rapid Transit Board, suggested that the west side problem should be solved by substituting for the tracks at grade an elevated four-track structure for freight and pas-

sengers, but no further action was taken in that direction.

In 1904 the Municipal Art Society discussed the waterfront problem and recommended:

(1) Freight subways for foreign and domestic commerce.
(2) Surface of streets for trucks.
(3) Elevated railroad for passengers.

The Chamber of Commerce has given such thought to the general subject of improved methods of freight distribution. The report of the Committee on Foreign Commerce and the Revenue Laws (Gustav H. Schwab, Chairman), dated December 28, 1906, refers to inadequate provision of piers and wharves offered by the city, and advises the adoption of a broad and comprehensive plan for the improvement of the terminal facilities of New York. As a result, the Chamber of Commerce adopted the following resolutions:

Whereas, the commerce of the city of New York is hampered by lack of modern terminal facilities; and

Whereas, this condition, if not relieved, will result in serious danger to the welfare and future supremacy of New York City; therefore, be it

RESOLVED, That the appointment of a special committee of five is recommended, with power to add to their number and report a comprehensive plan for the future treatment and development of the waterfront of New York in its relation to commerce.

The special committee was appointed and made a preliminary report which was adopted by the Chamber of Commerce November 7, 1907. This report called attention to the impracticability of the plan offered by the Board of Consulting Engineers of the Dock Department; advised against the adoption of an elevated railroad because of its impracticability at the present time; enlarged upon the congestion in the streets of the city caused by the transportation of goods by truck; and deplored the waning importance of the waterfront along the East river, and the increasing element of danger to navigation in the passage around the Battery.

Freight Congestion in Worth Street.

Church Street.

Leonard Street.

Mercer Street.

The final report of the Committee on Foreign Commerce and the Revenue Laws, adopted by the Chamber of Commerce January 2, 1908, called attention to the increasing needs of canal traffic for additional open piers; recommended that the policy of the city should in the future cause an increase in the number of open piers as existing leases expire; and concluded by stating:

"Your committee, in presenting these suggestions and recommendations of possible remedies for the relief of terminal conditions as they now exist in this port, regret that they have been unable thus far to discover any method by which the traffic congestion in the marginal streets on the waterfront might be relieved. This, in the opinion of your committee, is a subject which is properly part of the problem of the regulation of street traffic, a problem rendered especially difficult by the configuration of Manhattan Island, and by the constantly increasing volume of business transacted in its limited area."

It is therefore evident that the necessity exists for a broad solution of the problem of freight distribution on Manhattan island, and that as yet no adequate remedy has been devised.

REQUIREMENTS OF COMMERCE.

The first requirement of a great port like New York is ample space for the accommodation of water carriers, in close relation to railroads, warehouses and the active business district of the city.

To understand this feature a knowledge is necessary of the extent and usage of the available water frontage near the commercial section of Manhattan island, as given in the following table:

User.	North river south of 72d St.			East river south of 44th St.			Totals.		
	No.	Lin.ft.	Per ct.	No.	Lin.ft.	Per ct.	No.	Lin.ft.	Per ct.
R.Rs. excl. of ferries..	8	9,460	30	6	2,680	10	14	12,140	21
Foreign steamships...	12	7,446	23	1	137	½	13	7,583	13
Coastwise, river and sound lines	16	4,084	13	7	3,208	12	23	7,292	12½
Ferries	10	2,132	7	12	3,010	11	22	5,142	9
Municipal purposes ..	5	1,962	6	10	2,415	9	15	4,377	7½
Misc. purposes.....	—	6,451	21	—	15,620	57½	—	22,071	37
Totals	—	31,535	100	—	27,070	100	—	58,605	100

Thus foreign and domestic steamship lines each have but 13 per cent. of the available river frontage; whereas the railroads utilize 21 per cent. for the reception and delivery of freight, and with existing methods of distribution will need a larger percentage in the future to accommodate their growing traffic. The canal interests will also require more space upon the completion of the Erie canal enlargement.

With the available water frontage on the commercial portion of Manhattan island incapable of enlargement, and with an urgent demand by the water carriers for more room, it is apparent that some method of land carriage must be devised that will decrease rather than increase the need of railroad space on the waterfront. The evidence given before the New York Commerce Commission in 1900 shows conclusively that something must be done to enlarge the waterfront facilities of Manhattan island if the port is to maintain its pre-eminence.

A knowledge of the volume and cost of handling traffic on Manhattan island is essential to an intelligent conclusion. The tonnage that more vitally affects the subject under discussion is the part that requires draying on the city streets. From the carriers and other authoritative sources the following information has been obtained, applicable to the year 1906-1907:

Rough Approximate Estimates of Costs of Various Subway and Elevated Railroad Schemes, including Terminals.

No. of scheme.	Description of Schemes. N. Y. C. & H. R. R.R., West Side Schemes. Spuyten Duyvil to 59th St.	59th St. to 30th St.	30th St. to vicinity of St. John's Park.	Vicinity of St. John's Park to Battery.	Estimated cost including terminals.
1.	Provision for 6	.....	.....	.....	$13,000,000
2.	tracks and in-	2-trk sub.	2-trk sub.	.....	34,000,000
3.	creased termi-	4-trk "	.....	.....	19,000,000
4.	nals	4-trk "	2-trk sub.	.....	32,500,000
5.*	" " "	6-trk "	.....	.....	21,500,000
6.	" " "	6-trk "	2-trk elev.	.....	29,000,000
7.	" " "	6-trk "	4-trk "	.....	31,000,000
8.	" " "	6-trk "	4-trk "	2-trk elev.	32,500,000
9.	" " "	2-trk elev.	.....	.....	15,500,000
10.	" " "	2-trk "	2-trk elev.	.....	23,000,000
11.	" " "	2-trk "	2-trk "	2-trk elev.	24,500,000
12.	" " "	4-trk "	.....	.....	17,000,000
13.	" " "	4-trk "	4-trk elev.	.....	26,500,000
14.	" " "	4-trk "	4-trk "	2-trk elev.	28,000,000
15.	" " "	4-trk "	4-trk "	4-trk "	29,500,000
16.	" " "	6-trk "	.....	.....	18,500,000
17.	" " "	6-trk "	2-trk elev.	.....	26,000,000
18.	" " "	6-trk "	4-trk "	.....	28,000,000
19.*	" " "	6-trk "	4-trk "	2-trk elev.	29,500,000
20.	" " "	6-trk "	4-trk "	4-trk "	31,000,000
	Cartage Belt Line for Freight.				
21.	4-track belt line on Manhattan Island; 4 tracks to railroad connections in New Jersey; 2 tracks to connections with railroads in The Bronx and 40 miles of street distribution.....		80,000,000 to		100,000,000
	Terminal Belt Line for Passengers.				
22.	2-trk subway Blackwell's Isld. bridge, to 12th Ave. 2-track elev. on marginal way, 60th to 30th St... 4-trk elev. on marginal way, 30th St. to Battery.. 2-trk elev. along East river from the Battery to 42d street. ..... 2-trk subway, East river to North river, via Grand Central Station and Penn. R.R. Station; also 2-trk subway along the east side of Manhattan Island to Blackwell's Island bridge				25,000,000 to †35,000,000
23.	Same as (22) with 4 instead of 2 tracks in the marginal way, 60th St. to 30th St..		†27,000,000 to		37,000,000
24.	N. Y. C. & H. R. R.R. crosstown subway, 2 tracks..				5,500,000
25.	N. Y. C. & H. R. R.R. crosstown subway, 4 tracks..				8,500,000

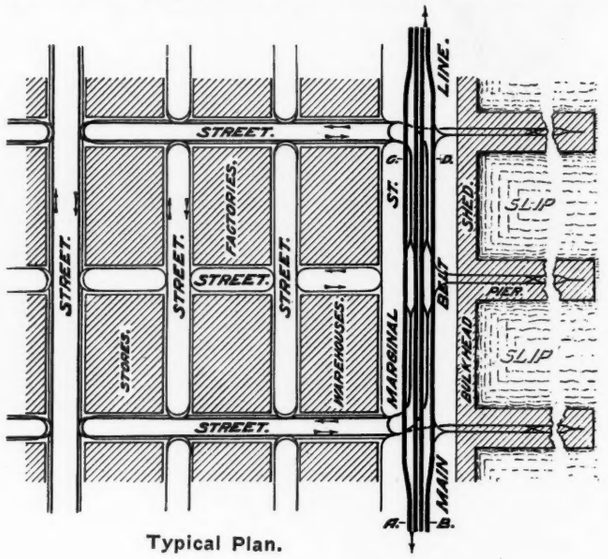
*Add for future enlargements to accommodate increased volume of traffic, $19,000,000.
†Exclusive of equipment.

Approximate Tonnage of the Principal Rail and Water Carriers Requiring Drayage in Manhattan.

Carriers.	Tons. Merchandise.	Coal.	Total.
Railroads:			
Rail, delivery.....2,000,000			
Water, delivery 7,800,000			
	9,800,000	4,000,000	13,800,000
Foreign steamship lines:			
Terminating on Manhtn Isld1,400,000			
Terminating in New Jersey. 800,000			
	2,200,000	.....	2,200,000
Coastwise lines (incomplete).....	2,900,000	.....	2,900,000
River and sound lines (incomplete)....	1,300,000	.....	1,300,000
Irregular lines (incomplete).....	3,000,000	.....	3,000,000
Total	19,200,000	4,000,000	23,200,000

The cost of handling this tonnage is of vital importance. With the exception of the portion of the New York Central tonnage that is drayed to and from its rail terminal on Manhattan island, all freight carried by the railroads requires lighterage, and break of bulk on the waterfront. The cost of the lighterage in connection with this service was investigated by the New York Commerce Commission in 1908 and was found to widely vary, depending on the class of freight, the method of water transportation and the places of distribution. The average result, however, including interest, depreciation, taxes and insurance on plant and structures, and cost of wages and supplies, was shown to vary from 83 cents to 88 cents per ton. No conclusive evidence was produced as to terminal costs on both sides of the river, including rentals, handling of freight and similar items; but data has been obtained from other authoritative sources. The cost of cartage on the city streets is found to vary, depending on the length of haul and the character of freight. For certain commodities it is as low as 60 cents per ton, and for others as high as $1.25 or more per ton. An average of 80 cents per ton is considered to be a conservative figure.

The following estimates of the cost of handling freight from the outlying yards of the railroad companies west of



Typical Plan.

Profile at Marginal Street.

Bergen Hill, New Jersey, and Sixtieth street, New York, to the shipper, are believed to be low rather than high.

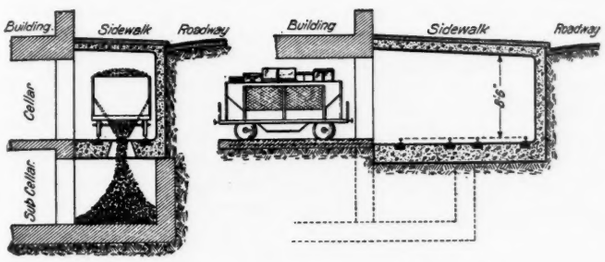
	Per ton.	
Railroad merchandise:		
Terminal costs on N. J. side of North river and at 60th St.	$0.15	
Lighterage or equivalent charges	.80	
Terminal cost on waterfront, Manhattan Island.....	.50	
Cost to railroads		$1.45
Cartage defrayed by shippers		.80
Total cost from outlying yards to shippers.....		$2.25
Coal: Handling, storage and lighterage or ferriage.....	$0.40	
Cartage	.60	
		$1.00
Steamship merchandise: Cartage.....		$0.80

Based on these figures the approximate annual terminal charges at Manhattan island for the tonnages handled by the principal carriers, exclusive of the large traffic of the minor carriers, are:

		Per annum.
9,800,000	tons at $2.25.....	$22,050,000
9,400,000	" " .80.....	7,520,000
4,000,000	" " 1.00.....	4,000,000
23,200,000	tons.	$33,570,000

In addition to the tonnage passing between the carriers and the shippers, there is a large volume of business that is redistributed from manufactories and warehouses to consumers. Owing to the time required to obtain reliable information on this feature no attempt has been made to include it in this report; but in seeking for a solution of the freight problem the necessity for more economical and expeditious methods of subdistribution should not be forgotten.

One of the handicaps of the commerce of the port is the delay in deliveries due to the time taken for the lighterage of freight to and from the island, and the interruptions from



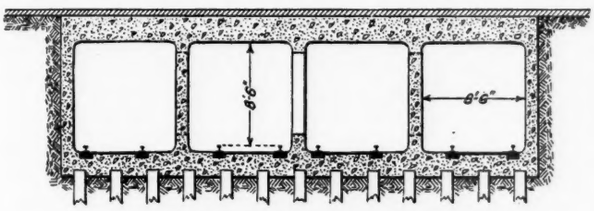
Single track. *Double track.*

Cross Sections at Building.

fogs and snow storms. Under favorable conditions the minimum time required for the transfer of freight from the New Jersey side of the North river to the consignee on the island is from three to six hours. An improved method of freight distribution should seek to reduce this time.

The growing importance of the port, as testified to before the New York Commerce Commission of 1900, is causing congestion of traffic in the harbor to such a degree that the time is not far distant when this will become a serious disadvantage, and therefore should have consideration in determining what shall be done to improve the situation.

The inaccessibility of the waterfront to the general public has a retarding effect upon its growth, more particularly along the East river, where rapid transit facilities are so far removed as to discourage the selection of that side of the island for passenger boat traffic. From the standpoint of commerce,



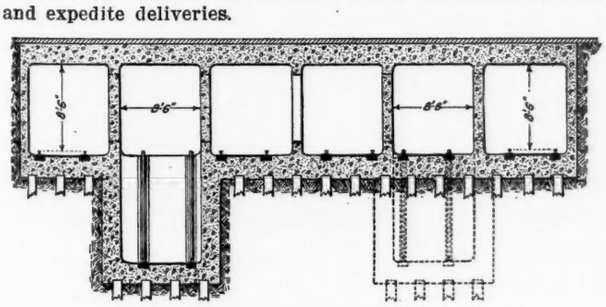
Cross Section Beneath Marginal Street.

improved passenger transportation methods should be considered in conjunction with a study of the freight problem.

To summarize, the commerce of the port of New York requires a solution of the freight problem that will abolish change of bulk on the waterfront and thus afford space for the expansion of steamship traffic; expedite deliveries; facilitate interchange of freight; reduce harbor congestion; improve accessibility of the waterfront to the public, and decrease costs of freight distribution and sub-distribution.

REQUIREMENTS OF THE PUBLIC.

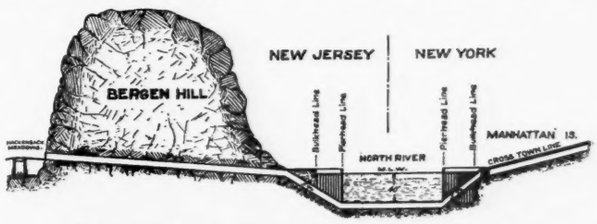
From the standpoint of the general public, a solution of the freight problem should result in the removal of vehicular traffic from the surface of the city streets, particularly in lower Manhattan island, where the arteries of travel, originally laid out for four-story buildings, are now gorged with the ebb and flow from 20, 30 and 40-story buildings. Relief of sidewalks and pavements from the distribution of freight, in addition to increasing their capacity for pedestrians, would greatly facilitate the movement of street cars, decrease noise, and expedite deliveries.



Cross Section Beneath Marginal Street.

The municipality will welcome any solution that promises a reduction in the cost of repairs and cleaning of streets. Each year 2,000,000 cartloads of rubbish, ashes and street cleanings are taken from Manhattan, chiefly by scow, at a cost of $2,000,000. Not only is this expense objectionable, but there is the necessary use of docks for the disposal of the waste materials, that could be used to advantage in the commerce of the port. The city would also be benefited by reduced cost of pavement repairs if vehicular traffic can be largely dispensed with for the distribution of freight.

The time and cost of handling mails between the down town general office and the Grand Central and Pennsylvania Railroad stations have a bearing on the welfare of the public. It is estimated that 100,000 tons of mail matter will require trucking between those points, at a cost of $230,000 per annum. In addition to the question of cost there is the 30 to 40



Profile Between New York and New Jersey.

minutes in time required in each direction by the present wagon method.

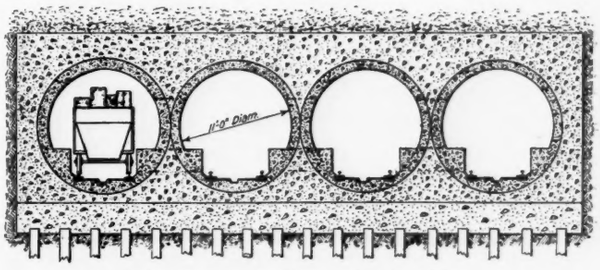
Comments similar to those made for the mail situation are applicable to the handling of express.

The disposal of excavation for new buildings is an important item and the public will be well served by any plan for handling freight that at the same time will permit the disposal of this material without clogging streets and without the necessity for the use of docks.

The public is vitally interested in the accessibility of the freight and passenger terminal facilities on the waterfront to the residential and business sections of Greater New York, to the Grand Central and the Pennsylvania Railroad stations, and to the commuting district on the north.

The elimination of tracks at grade on city streets, the betterment of the park districts and the abolition of the use of steam locomotives are, of course, also to be borne in mind.

To summarize, in solving the freight problem the interests



Subaqueous Section; North River.

of the public will be best served by a method that will eliminate grade crossings, abolish the use of steam locomotives, remove vehicular traffic from the congested portions of Manhattan island, expedite and cheapen costs of distribution of freight, mail, express and waste products, and improve the means of passenger transportation between the waterfront and the remaining sections of the city and outlying districts.

REQUIREMENTS OF THE CARRIERS.

From the standpoint of the railroads the solution of the freight problem should be such as to reduce the costs of distribution, expedite deliveries and afford opportunities for expansion of traffic at valuable terminals on both sides of the North river. Any plan that involves a large expenditure of capital, with no resultant economics to offset the increased

interest changes and taxes, will naturally be unwelcome to the transportation interests. Therefore, whatever may be proposed should offer to the carriers the same attractions in lessened cost of operation that are offered to the commerce of the port in the way of reduced costs of distribution.

PROPOSED SOLUTION OF THE PROBLEM.

The necessity for an immediate solution of the west side problem has led to the consideration of three different methods:

(1) Complete removal of the tracks of N. Y. C. & H. R. R.R. south of Spuyten Duyvil, this being the alternative method specified in the Saxe law; or,
(2) The depression of the tracks of the N. Y. C. & H. R. R.R. into a subway wherever streets and public places are affected between Spuyten Duyvil and St. Johns Park, as required by the Saxe law; or
(3) Tracks to remain on the surface from Spuyten Duyvil to 60th street, except where it is proposed that they shall be elevated at Manhattanville so that the streets may pass beneath; a subway from 60th street to 30th street, and an elevated railroad from 30th street to St. Johns Park.

The first method is antagonistic to the interests of the public and of the port, because of the enormous expense that will thereby be imposed upon the city for the value of the property taken and for the indirect damages to the company from the loss of the principal terminal of a railroad system of 50,000 miles; and because of the necessity that will be forced upon the railroad of securing additional space for river; as a result of which the cost and time of delivery of the constantly increasing wagon traffic between the steamship and railroad terminals in New Jersey and the consumers on Manhattan island will be seriously increased.

The question therefore arises, why not adopt a method of freight transportation and distribution that will afford rail access to Manhattan island by all of the trunk lines so that the trans-shipment of freight may be made at remote points where space is less congested and costly than along the waterfront, using a type of car that will have sufficient capacity to accommodate the largest packages of merchandise and still economize space so as to permit the delivery of cars direct to the water carrier, merchant and manufacturer, free from contact with the surface of the city streets and removed from the expenses, uncertainties and delays of harbor navigation.

To meet these conditions, a system of cartage subways for standard gage tracks is suggested, located immediately beneath the sidewalks of Manhattan island, tapping both sides of the principal business streets below Forty-second street. As illustrated on the attached exhibits, this system is encircled by a high-speed belt line that is connected with railroads terminating on the west side of the North river; with the Sixtieth street yard of the N. Y. C. & H. R. R. R. on Manhattan island, and with the railroad terminals in the

SUMMARY OF TONNAGE STATISTICS OF THE PRINCIPAL RAIL AND WATER CARRIERS SERVING MANHATTAN ISLAND.

Item.	Carrier.	Inbound, tons. Requiring drayage.	Inbound, tons. Lightered & not requiring drayage.	Inbound, tons. Totals.	Outbound, tons. Requiring drayage.	Outbound, tons. Lightered & not requiring drayage.	Outbound, tons. Totals.	Total, tons. Requiring drayage.	Total, tons. Lightered & not requiring drayage.	Total, tons. Totals.	Remarks.
1.	Railroads:										
	Merchandise ...	6,728,239	2,136,099	8,864,338	3,039,705	1,213,549	4,253,254	9,767,944	3,349,648	13,117,592	
	Coal	3,953,840	.....	3,953,840	.....	.....	.....	3,953,840	.....	3,953,840	Coal to power stat'ns on waterfront not inc.
	Total	10,682,079	2,136,099	12,818,178	3,039,705	1,213,549	4,253,254	13,721,784	3,349,648	17,071,432	
2.	Trans-Atl. Lines..	559,500	997,500	1,557,000	805,500	1,583,500	2,389,000	1,365,000	2,581,000	3,946,000	Bklyn & N. J. not inc.
3.	Coastwise Lines ..	1,437,000	1,989,000	3,426,000	1,476,000	1,859,000	3,335,000	2,913,000	3,848,000	6,761,000	Incomplete.
4.	Sound Lines	774,101	266,283	1,040,384	604,456	588,376	1,192,832	1,378,557	854,659	2,233,216	Incomplete.
5.	River Lines.....	Collection of data still in progress.									
6.	Irreg. Lines,*	3,000,000	.....	3,000,000	.....	.....	.....	3,000,000	.....	3,000,000	Incomplete.
7.	Total (omit 5)	16,452,680	5,388,882	21,841,562	5,925,661	5,244,425	11,170,086	22,378,341	10,633,307	33,011,648	Incomplete.

*Including tramps, barges, sailing vessels.

NOTE.—Total tonnage (Item 7) include considerable duplication. A large portion of the tonnage lightered to and from water carriers is included in the railroad tonnage. About 20 per cent. (say 1,000,000 tons annually) of the water carrier tonnage that is drayed, also appears in the railroad tonnage. For the purposes of this report it may be assumed that the river traffic and the business of the "irregular lines" will more than offset the duplications in the totals.

handling its traffic along a waterfront already inadequate for the demands of waterborne commerce.

The second method is physically and financially impracticable.

The third method, which is the one substantially agreed upon between the late Rapid Transit Board and the railroad company and which failed to receive the sanction of the legislature, is entirely feasible but has the fatal objections of entailing a great expense on the railroad company, estimated at from 30 to 40 million dollars, with no reduction of cost of operation nor promise of increased traffic to offset the added interest charges and taxes. Ultimately this burden, if assumed, equivalent to about 50 cents per ton, will result in a raise of freight rates or financial embarrassment to the company.

Moreover, any treatment of the freight tracks of the New York Central that involves the continued entrance of standard freight cars to lower Manhattan, either by subway or an elevated structure, will seriously interfere with the use of the streets affected for future passenger rapid transit routes; will prohibit connections with industries and the waterfront because of physical difficulties and expensive costs; will increase rather than decrease the cost of freight delivery; and above all, offers no relief from the present costly, slow and congested vehicular distribution of freight on the surface of the city streets.

It may also be added that the completion of passenger tunnel routes beneath the North river will eventually cause the same deterioration of ferry service that has already followed the opening of the tunnel and bridge crossings of the East Bronx. Provision is shown for future extensions to Long Island City and Brooklyn and along the New Jersey waterfront.

The size of the subways will permit the handling of at least 90 per cent. of all the commerce of lower Manhattan island, with but one change of bulk at points remote from the congested portions of the city; and with a type of electrically propelled car that can be easily handled on steep grades, sharp curves and on elevators in the shipping and commercial districts, and that can be despatched over the tracks of connecting trunk lines to industries within a considerable distance of New York, free from the delay and expense incident to trans-shipment of freight. The occupation of the space beneath the sidewalks will not interfere with the use of streets for future subways, will cause minimum interference with sewers and other sub-surface structures, will relieve pedestrians from the interference of boxes and barrels on the surface, will be immediately adjacent to the portion of the business houses now used for the storage and handling of freight, and will afford unexampled facilities for the collection and disposal of street sweepings, ashes, garbage, excavated materials and snow.

The relief of the marginal way from trucking will make that wide thoroughfare available for an aesthetically designed elevated passenger railroad and for automobile and light vehicular traffic between the business and residential sections of the island.

The roughly approximate estimates of cost range from $80,000,000 to $100,000,000.

Taking into account all fixed charges and costs of operation,

this scheme will permit the distribution of freight, mail and express and the waste products of the city at much less than present costs, so that after paying a fair return on the investment there should be net savings and profits to shippers, carriers, investors and the public a sum in excess of $15,000,000 per annum.

In addition to the pecuniary returns, this scheme holds forth the following advantages:

(a) Solves the West Side problem, securing to the city the benefits of an elimination of tracks at grade in city streets, the abolition of steam locomotives and the betterment of the park districts;
(b) Releases the New York Central from the necessity of an unprofitable large capital expediture, estimated at $40,000,000;
(c) Renders feasible rail connections to industries and the water front;
(d) Avoids interference with the use of the marginal ways for passenger railroads;
(e) Relieves the city streets from vehicular traffic, thus reducing noise, cost of pavement repairs, congestion of sidewalks and pavements, delays to street cars and cost of street cleaning and disposal of waste products;
(f) Relieves congestion and the uncertainties of harbor navigation;
(g) Makes practicable the access to Manhattan Island of all railroads by rail connection direct to shippers; and
(h) Releases docks and piers from railroad uses, thus permitting their occupation for the expansion of water-carrier traffic and thereby facilitating the commerce of the port.

Objections will be urged against this suggested solution of New York's freight problem that it involves revocation of temporary vault privileges; that future passenger subway stations, where affected, will have to be placed deeper than otherwise would be necessary; that a somewhat similar scheme at Chicago has not yet proved successful, and that the plan is a radical departure from existing methods and involves a co-operation of many interests in the states of New York and New Jersey.

To such criticisms the reply may be made that the advantages to abutting owners from access to a freight system of the character proposed will far outweigh the loss to those whose vault privileges are abridged; that the future subway stations, where affected, will have to be no lower than such important existing stations at the Grand Central Station, Brooklyn Bridge, Fourteenth street and Ninety-sixth street, where mezzanine floors are required; that the handicaps of the Chicago subway from insufficient size of tunnel, grade crossings of traffic, trans-shipment in congested freight stations, lack of classification yards, and depths too great for economical connections with shippers, will all be avoided; and that the advantages to the commerce of the port, to the railroads, the water-carriers and the public are great enough to warrant the surmounting of the difficulties that always attend a departure from faulty methods of long standing.

CONCLUSIONS.

An analysis of the freight problem of Manhattan island appears to justify the conclusion that the present status is advantageous neither to the public nor the carriers; that previous studies and reports over a period of 40 years favor an elevated railroad on the waterfront for passenger but not for freight purposes; that the leading commercial interests of the community are seeking a solution that will retain to the city its supremacy as the leading port of the country; that the general public will be most benefited by a method that will relieve the streets of vehicular traffic; that the water and rail carriers will support a treatment of the subject that will expedite and cheapen the distribution of freight; and that the proper solution appears to lie in the adoption of an electrically operated cartage subway system beneath the sidewalks of the business districts of Manhattan, connected by high-speed routes with the principal rail and water carriers of the port.

With suitable arrangements for harmonizing the various interests in New York and New Jersey, the suggested solution is believed to have sufficient merit to attract the investment of private capital under terms alike attractive to the investor and the municipality.

CAR WHEEL STRESSES.

BY GEORGE L. FOWLER.

At the last convention of the Master Car Builders' Association, there were a few topical discussions that were omitted from the program because of the time occupied in reading and discussing papers and committee reports. Among these was a report on the stresses to which car wheels are subjected in service, a topic that has attracted much attention during the past two years, both on account of the failures that have developed in cast-iron wheels under cars of 100,000 lbs. capacity and of the attempts that have been made to measure the stresses that caused them. Probably little in the way of the dissemination of useful knowledge was lost by the failure of the association to take up this subject, as there is very little to disseminate, but it was thought that suggestions might be made in discussion that would lead to a more thorough investivation of the subject than has thus far been made.

It is not much more than 10 years since the first cars of 100,000 lbs. capacity were introduced for regular traffic, and when this was done cast-iron wheels were used with all of the confidence with which they had been placed under the lighter capacity rolling stock previously used, and it was some time before a realization of the actual conditions was forced upon the consciousness of railroad officers. Before that time we had been working so well within the limits of the capacities of wheels and rails that no one appreciated the fact that there was a limit, and any suggestion as to the advisability of investigating wheel and rail stresses would have been regarded as an unnecessary refinement of no practical use. But the adoption of these high capacity cars showed that there was such a thing as the dynamics of wheel stresses, and now the question is very much alive.

It is assumed here that in the assignment of the topic at the convention, the stresses in cast-iron wheels under cars of 100,000 lbs. capacity were what the committee had in mind. These stresses may be caused by vertical load, lateral thrust of the wheel against the rail, slip of the wheel on curves, cramping of the wheel against the rail by the resistance to truck movement caused by the side bearings and center plates, internal stresses inherent in the wheel due to the material and the method of manufacture, and the frictional resistance and heating resulting from brakeshoe application.

Of the magnitude of all of these stresses we know almost absolutely nothing, with the exception of the first two, where some slight investigations have been made which indicate that under ordinary working conditions the stresses are not a negligible quantity.

No attempt, aside from the measurements of rail deflection, have been made to determine actual vertical stresses at the point of contact of the wheel and rail, but, in an investigation into bolster stresses, made a number of years ago, it was found that the vertical load varied from 20 to 50 per cent. in excess of the static load, dependent upon the condition of the track and the speed of the train, and that the application of this excess seemed to be coincident with the passage of the rail joints. This was certainly the case at low speeds on a rough track and seemed to be, also, at moderate speeds of 25 miles an hour on smooth track, though this has not been proved, as it may have been mainly caused by the natural vibration of the springs. These results were obtained under a car of 60,000 lbs. capacity loaded with car wheels.

Now, if it is conceded that at least the same multiplication of the vertical load occurs at the rail as at the spring supported bolster, then a wheel whose normal load is 18,750 lbs. would, at times, exert a pressure of at least 22,500 lbs. on the rail, which, if time were allowed, would cause the metal of the rail to flow and take a permanent set. But this is based upon an assumption, which, however reasonable it may be, cannot be absolutely relied upon. So in the matter of vertical stresses we have only a dim suggestion of what is

happening, but that suggestion is enough to be worthy of attention, especially in view of the concentration of pressure upon the small area of contact between the wheel and the rail. For a static load of 19,000 lbs., the area of contact was, in one case, found to be .19 sq. in., so that the actual average load on this small spot was 100,000 lbs. per sq. in. Whether this would hold on a rolling wheel cannot be stated, for time for movement is an important factor in the compression and flow of metal. But, at any rate, it would probably not be much less than this and certainly far above the stresses that anyone would dare to use in construction. So we know but little of the actual vertical stresses.

We know as little about the lateral thrust of the wheel against the rail. The only investigations along these lines that have been published are those that appeared in the *Railroad Gazette* for November 15, 1907. These were startling, and if the assumption is granted that the whole thrust, ranging from zero to 30,000 lbs. or more, is taken by the flange, the load on this is a matter of serious import. It is not probable, however, that this is strictly the case; but, then, there is a certain amount of cramping of the wheel on curves that has not been measured and which may be an important contributor to flange breakages. It appears probable, from the small amount of work that has been done, that this lateral thrust varies with the speed and inversely with the radius of curvature. As for the nosing blows struck while the car is running on a tangent, we know nothing, though it is not probable that these are very great, since the freight car is always subjected to the controlling influence of the car or locomotive next to it, and will not develop the same tendency to nose that is manifested either by a free-running electric car, or by the first car of an electric train. This portion of the field is, therefore, open to further investigation and the field is a broad one.

As for the blows, which an improperly-gaged wheel may receive, from a guard rail, or an improperly-set guard rail may deliver to a wheel, they are enormous and are correspondingly destructive.

That one of the wheels of a pair must slip in the passage of a curve is self-evident. The amount of the slip is also readily calculated if the degrees of curvature are known. But with that our information ends. Which wheel slips, or do both slip? Arguments can be presented that, if the premises are granted, will prove that either the inside or the outside wheel does the slipping, according to the said premises. Then, when the wheel does slip, is the coefficient of friction and of resistance the same as when the wheels are skidded by the application of the brakes, or in a testing machine, or does the rotation of the wheel so change the condition of action that no known law holds, and there are an entirely different set of coefficients effective?

So we simply know that, when a pair of rigidly connected wheels passes around a curve on a railroad track something slips, but whether it is one wheel or both, we do not know, and we are equaly ignorant of the stress that this particular action puts upon the wheel.

What do we know about the resistance set up by the side bearings? With the exception of a few meager investigations, very little that is definite is available. These investigations seem to indicate that, when the car is carried on the side bearings, even though they may be ever so well lubricated, there is a cramping of the truck which tends to keep the flanges out against the rails, and further, that the pressure on the side bearings when the car passes a curve, increases with the clearance. But, as yet, nothing has been done to ascertain what may be the resistance to turning set up by the center plates and side bearings under the various conditions of surface, quality of metal and clearance that may exist. There is a probability, however, that this may be cleared up during the next few months, and thus some definite knowledge be obtained as to the influence of these parts of the car on flange wear and wheel pressures.

It is a well known fact that all castings, and especially cast-iron wheels, are subjected to internal stresses of greater or less intensity, due to the method of manufacture. In the production of these stresses almost every element in their production probably plays its part: the mixture of the metal, the temperature of pouring, the rate of pouring, the shape of the pattern, the kind of chill, the chemical composition of the metal, the kind of sand, its temper and the ramming to which it has been subjected, the rate of cooling, the temperature in the annealing pits, and all these so interlocked and dove-tailed together that it appears to be a well-nigh hopeless task to determine as to just what the influence of any one factor may be. We simply know that the resultant is an item of importance, as evidenced by the fact that a cutting or cracking of the rim in certain ways will cause a springing of the adjacent edges past each other by very considerable amounts; but as to just what the force may be that causes this springing or what stress it puts upon the metal of the wheel per square inch, no one knows. The determination of this, followed by careful foundry work looking towards an elimination of the same is, therefore, suggested as one of the most promising means of eliminating this quality which is apparently one of the dangers that threaten the usefulness of the cast-iron wheel under high capacity cars.

While this discussion is directed especially in the direction of the cast-iron wheel, it is evident that all of the external stresses apply equally well to the solid steel and steel-tired wheel. But in the matter of internal stresses it is evident that they do not prevail. An ordinary steel tire or a rolled-steel wheel, is almost free from these stresses, and when cut does not spring enough to indicate that they are at all excessive. Of course, a steel tire shrunk upon a center is under a tensile stress, but how much this amounts to, we do not know.

We finally come to that cause of stress to which many attribute all or the major portion of flange and tread failures under high capacity cars—brake-shoe, heating and friction. That long-continued application of the brakeshoes on mountain grades with the heating that results, followed as it often is by sudden or local cooling, is about as bad a thing as can happen to a cast-iron wheel, will be readily conceded. But just how hot a wheel becomes or what stresses may be set up, because of that heating or cooling, we do not know, and so can simply talk vaguely on a subject—learnedly and confidently, if you choose—for there is no one fortified by facts to contradict.

So, when we sum up all that we know on this subject of car wheel stresses, it must be regretfully confessed that it is mightily little.

Now, it is a recognized principle of both physic and physics that where there is trouble in the organism or the mechanism, the first thing to do, before attempting to apply a remedy, is to make an examination of the body or the machine and find out what the trouble is. Then, when the condition is known and the cause has been determined, it is possible to go to work intelligently in the application of the remedy. But to go blindly to work by the administration of nostrums or increase of dimensions is to revert to the old days of witch doctor and the rule-of-thumb mechanic. By this it is not intended to suggest in any way that the car wheel manufacturers have been working altogether unintelligently or blindly in their attempts to improve their output, but it does seem that they have been and are greatly handicapped by an ignorance of the exact physical condition of their wheels and the stresses to which they are subjected in service, an ignorance that could be done away with to a great extent by an investigation of the subject. And when such an investigation has been made, and not before, will they be in a position to decide whether the cast-iron wheel can be made to meet the very exacting requirements of heavy service under the modern high capacity car.

General News Section.

The *New York Tribune* publishes a despatch from Pekin, China, which says that negotiations are under way for a loan of £5,000,000 ($25,000,000) by the government for a redemption of the bonds of the Pekin-Hankow Railroad. Final decision has been reserved, but a domestic loan of £2,000,000 ($10,000,000) has been authorized.

On October 9, in a cave-in on the bank of the Mississippi river at New Orleans, a strip of land between Washington avenue and Fourth street, 300 ft. long and 200 ft. wide, it is said, slid into the river. Two tracks of the Illinois Central and two tracks of the New Orleans Public Belt, together with several freight cars, were carried down.

The recently organized institution for the encouragement of irrigation and the development of agriculture in Mexico has placed with Speyer & Co., the National City Bank, New York, and associates of Speyer & Co. abroad, $25,000,000 gold 35-year, 4½ per cent. bonds guaranteed as to interest, principal and sinking fund by the Mexican government.

The following railroads, after pleading guilty, were fined in the United States District Court at Leavenworth, Kan., for violating the 28-hour livestock law: Atchison, Topeka & Santa Fe, $700 on three counts; Chicago, Rock Island & Pacific, $6,850 on 53 counts; Northern Pacific, $600 on four counts, and St. Louis & San Francisco, $1,200 on 11 counts.

The State Board of Equalization of Washington has abandoned its original intention to assess the railroads of that state at 60 per cent. of their value as ascertained by the State Railroad Commission. Instead, the roads will be assessed the same percentage of their actual value in each county as other property is assessed in that county. The gross assessment on which all the railroads in the state will be taxed is $84,642,349.

Press despatches from Winnipeg, which often seem to contradict one another, indicate that the boilermakers on the western lines of the Canadian Pacific refuse to accept the settlement made for them by the union leaders, and have not returned to work. The boilermen's union officials have instructed members not to return. Of the 800 mechanics who have returned to work in Winnipeg, all are dissatisfied and assert that the leaders have sold them like sheep.

In a suit brought by the Atlantic Coast Line in probate court at Montgomery, Ala., contesting the tax assessed in Alabama against foreign corporations, the railroad company claimed that it was not a foreign corporation because it had absorbed the Georgia & Alabama, the Midland Railroad and other Alabama roads. The company is suing to recover $20,000 that it has paid. It also claims that the law is unconstitutional. The Louisville & Nashville lost a similar case some time ago.

It was recently reported that Harriman interests had pledged $14,000,000 for the electrification of Erie suburban lines near New York City. This is denied, and an official of the road is quoted as saying that the only work planned at present is the electrification of 32 miles of road from Jersey City, N. J., to Suffern, and that this work will probably begin within a few months. Future plans will depend on the success of this first installation. Surveys and estimates on this line will probably take two months.

George D. Wadley, formerly Second Vice-President and General Manager of the Atlanta, Birmingham & Atlantic, and James R. Gray, Editor of the Atlanta *Journal*, have been appointed members of a committee which, according to a recent act of the Georgia legislature, is to investigate the question of extending the Western & Atlantic from Atlanta to the sea. The road is owned by the state and operated under lease by the Nashville, Chattanooga & St. Louis. Two other members are to be appointed to the commission.

Last week the Twentieth Century Limited of the New York Central ran from Chicago to New York on schedule time with nine cars instead of the usual five, extra cars being used to carry the Chicago National League baseball team. It is said that the government may now call on the New York Central to carry all kinds of mail on this train. At present only a small amount of first class mail is carried, as the New York Central claimed when the train was first put on that the addition of a postal car would interfere with the schedule.

On the Middle division of the Pennsylvania Railroad the employees in the operating department are now being paid in cash, from a brand new pay-car, recently turned out of the Altoona shops. The change from check payments to cash has been made on a number of divisions of the road and soon will be extended to all. The sum of each employee's pay for any given period ends in either 0 or 5, so that one-cent pieces are not used in paying. Shopmen are to be paid in checks as heretofore, and pensioners will be paid in checks sent from the superintendent's office.

The October bulletin of the Indiana Manufacturers' and Shippers' Association says that the executive committee of this organization will seek at the next session of the state legislature the passage of a public utilities law similar to that of New York. A bill has already been drafted. The association will also seek legislation to strengthen the traffic department of the State Railroad Commission so that it may work with the traffic managers of the shipping concerns in discovering discriminations in rates and enforcing rules looking to the correction of railroad abuses.

Commissioner McMaster, of the insurance department of South Carolina, has summoned the American Surety Co. to show cause, October 30, why its license in the state should not be revoked. This action is taken on the complaint of C. D. Miller, who has lost his place as agent for the Southern Railway at Fort Miller, because the surety company has refused longer to be bondsman for him. Miller declares that the surety company is persecuting him because, in a case on another road, he had testified against it. He is now unable to get a bond from any other company, because the first question asked is whether or not his bond has been refused by any surety company.

The New York Public Service Commission, Second District, has reported to the legislature on the need of grade crossing elimination. The commission recommended that a sufficient appropriation be made to pay the share of the state toward carrying out the work. Heretofore, the money available has always been too little to allow action on all the applications and this fact deters railroads and municipalities from filing petitions. Since 1898, when the grade crossing law became effective, the state has appropriated something over $1,500,000 for the elimination of 250 grade crossings. Since 1890, Massachusetts has spent $7,000,000 for this work. There are now in New York 8,733 grade crossings on steam railroads. During the last ten years, 1,016 people have been killed and 911 injured at these points. Of these crossings, 6,793 are unprotected, and at these 707 people have been killed and 657 injured.

The New York State Public Service Commission is still holding hearings on the "Eleventh Avenue Railroad Problem," which means the problem of safety on Eleventh avenue, New York city, where trains of the New York Central, moving at low speed, traverse the street for something over a mile. Not long since the commission ordered the railroad company to increase the number of watchmen at transverse streets along the line. This order was based on testimony that many persons had been injured by the freight trains; but at the last hearing it came out that most of the casualties are to men and boys who jump on to the freight cars to steal rides for a few blocks. The complainants before the commission thought that the railroad company ought to furnish a sufficient number of special policemen to keep these trespassers off the cars. One of the enginemen running on this line,

being questioned, could not remember a case of a pedestrian having been struck by an engine.

The conditions printed on the back of the universal telegraph blank do not form a valid contract, according to the decision made by Judge E. Ray Stevens, of the Circuit Court for Dane county, Wis., in the case of A. O. Fox vs. the Postal Telegraph Co. for damages consequent on delay in delivering a telegram. The court awarded Mr. Fox, who is president of the Northern Electrical Manufacturing Co., of Madison, Wis., $157 with interest from January, 1907. Judge Stevens said that in Wisconsin the conditions are unreasonable and void as against sound public policy, and that this public policy is not a regulation of interstate commerce but simply a declaration of the legal duties imposed by the common law upon the defendant in the transaction of its business. He says that if the delay in the delivery of the telegram had occurred in a small town, this might not, standing alone, be sufficient evidence to warrant a finding of negligence, but the delay was in the heart of Chicago and cannot be excused.

A conference regarding the proposed electrification of the Illinois Central at Chicago was held on October 13, with Mayor Busse, Dr. W. A. Evans, Health Commissioner, L. P. Bird, Smoke Inspector, and Alderman Milton J. Foreman representing the city, and J. T. Harahan, I. G. Rawn, L. C. Fritch and J. G. Drennan, District Attorney, for the Illinois Central. After the meeting, Mayor Busse said that President Harahan had said that the directors of the road had given authority for a thorough investigation. The problem was quite different from that in New York, where electrified lines are used solely for passenger business within the city. The Illinois Central will have to handle freight and passenger traffic on the same tracks. President Harahan did not know when the report of the experts appointed to investigate conditions would be ready, but promised the city information in 30 days, when another conference will be held. Mayor Busse said that a report of an investigation by the health commissioner and the smoke inspector would be out in a few days. He felt that the attitude of the railroad was fair.

The New York Public Service Commission, Second District, has been holding hearings in the matter of the responsibility of railroads for forest fires in the Adirondacks. Representatives of railroad companies said that to alter equipment so as to burn oil instead of coal would be too expensive. It would also be impracticable to electrify the roads, as the water power in the Adirondacks would be insufficient during the dry season, just when traffic is heaviest. It was also asserted that the number of fires started by locomotive sparks was much overestimated, and that more blame should be laid to camping parties. Representatives of the Association for the Protection of the Adirondacks said that 90 per cent. of the fires were caused by coal-burning locomotives. The commission decided that Commissioner Osborne should start immediately on inspection trips, and that after that the commission would take testimony along the line of all roads where fires have occurred to investigate the actual cause. The commission's supervisor of equipment is to confer with mechanical department railroad officials as to the cost of changing fuel or motive power.

Pennsylvania Station in New York City.

A considerable portion of the steel frame of this station is now in place and the fireproofing is under way. Altogether there will be 1,000,000 sq. ft. of solid masonry floors in the building. More than 600,000 sq. ft. of hollow terra cotta blocks will be used for partitions and for covering steel columns. It is planned to make this an absolutely fireproof structure. Within the last few months great progress has been made on the station. In the center of the excavation there is a temporary wooden scaffolding, which cost the contractors $40,000, to be used for building the sky-light roof of the general waiting room. The waiting room will be 320 ft. long by 110 ft. wide.

The massive granite columns are already in position on the Seventh avenue front. These, which have the appearance of bearing much of the weight of the building, are supported underneath the street level by steel columns.

Cleveland Municipal Traction Co.

The plan of trusteeship for the stock of the Cleveland Municipal Traction Company has at last been completed. The present directors of the Municipal Traction Company will constitute the majority of the board of trustees and will remain in control of the property.

A list of safeguards suggested by some of the newspapers have been discarded, but it is believed that the report in general will prove satisfactory. The plan of trusteeship was completed Sunday morning and the directors of the Traction Company accepted it entire.

The seven directors and stockholders of that company—Tom L. Johnson, Ben T. Cable, A. D. Du Pont, William Drief, Luton D. Baker, C. W. Stage and F. C. Howe—will be trustees of the stock and to these the directors decided that the following might be added: F. H. Goff, president of the Cleveland Trust Company; Homer H. McKeehan, lawyer, and G. K. Shurtleff, secretary of the Y. M. C. A. Also, the mayor and city solicitor of Cleveland, hereafter to be elected, will be appointed additional members of the board, acting ex-officio, but Mayor Johnson and City Solicitor Baker will remain upon the board after their retirement from office. Thus, even after Mayor Johnson's administration is over, the traction directors will still constitute a majority of the board of trustees.

The men named as additional trustees of the stock have not yet formally accepted the trust. It was at first proposed in the meeting Sunday, that none but electors of the city of Cleveland should be trustees. To this Mayor Johnson objected, on the ground that this would exclude Ben T. Cable and F. H. Goff.

Stripped of its legal verbiage, the plans for trusteeing traction stock is practically a transferer of the entire issue of one hundred shares of Municipal shares to the trustees, who are granted the following expressed and declared power:

1. That vacancies arising from any cause shall be filled by the remaining trustees; that the trustees shall have the power to increase their number to eleven, and shall not permit the number to be reduced below seven; that certain officials yet to be designated shall be trustees ex-officio, but that the present mayor and city solicitor shall not cease to be trustees upon retiring from public office; that all interests in the capital stock shall cease with retirement from a trusteeship and vest in the remaining trustees.

It is provided that of the 100 shares of the company's stock each trustee shall have title to one share, and that the remainder, a very large majority, shall be held by all the trustees jointly. Each certificate shall state on its face that it is issued in trust.

2. The action of a majority of the trustees shall prevail as if assented to by all. The majority shall determine how the joint stock shall be voted. An accurate record of proceedings shall be kept.

3. The trustees shall exercise their powers as stockholders and as directors, in the case of any becoming such, to carry out the provisions of the lease from the Cleveland Railway Company and the grants from the city and other municipalities, the obligations to the public and the purposes of this trust.

Other provisions provide that if in the opinion of the trustees the directors have not used a sufficient amount of the earnings for the improvement of the service, betterments, equipments, maintenance, or in making extensions, the trustees may use for these purposes dividends which they may receive, and in so doing, they may take into consideration future advantages to be derived from such expenditures. They may also use such part of the dividend as they may see fit by the purchase of stock of the Cleveland Railway Company.

The trustees are in power to apply dividends for the purpose of furnishing the city with a light, heat and power plant for its streets, public buildings and parks, or in paying the cost of light, heat and power for the streets and public buildings from other than a municipal plant.

It is provided that the trustees shall spend this money upon plans approved by them and by the proper city officials as if these funds were derived from taxes.

Finally the trust shall terminate (a) if the city receives the right to acquire the street railways pursuant to the provisions of the security grant; (b) if it acquires the right pur-

suant to the provisions of the lease; (c) if the legislation is provided enabling the city and the traction company to enter into a direct contract making the city the beneficial owner of the stock, or of the surplus earnings, or vesting in the city the right to control the management and the profits.

No trustee shall incur any personal responsibility for the act, neglect or default of any of his co-trustees, nor any personal liability for any act, neglect or default of himself except for his individual malfeasance or want of good faith.

Firemen's Brotherhood.

At the convention of the Locomotive Firemen's Brotherhood, held in Columbus, Ohio, last week, W. S. Carter, heretofore Secretary and Treasurer, was elected Grand Master, succeeding John J. Hannahan. The next convention will be held at St. Paul in June, 1910.

Railway Business Association.

On October 14 the first general circular of the Railway Business Association was mailed to some 1,400 firms and individuals interested in this movement. This circular explains just what the association is, what it proposes to do, and the manner in which it is to be done, primarily for the purpose of enlisting new members, and it contains a blank application form. A number of requests for these blanks have been received unsolicited, and generally a very enthusiastic interest has been shown both by supply manufacturers and railroad officers. Several of the latter have notified the association that they are ready to co-operate with it in every possible manner. The headquarters of the association were opened on October 12 at 1408 United States Express building, 2 Rector street, New York. The circular just mailed is as follows:

The Railway Business Association, an organization composed of manufacturers of railroad materials and equipment, contractors in railroad construction and dealers in miscellaneous railroad supplies, was formed at the Waldorf-Astoria, New York, on Sept. 30, 1908, with more than 100 concerns represented, either in person or by letter of approval. A pamphlet containing an account of the meeting will be mailed to you this week. The matter is one of vital importance to you. Will you not make sure that this pamphlet comes under your own eye and give it a careful reading?

The Railway Business Association was formed for the following reasons and purposes:

A wave of criticism, prejudice, and, in some states, animosity against the railroads has been spreading. It has, in many cases, been most unreasonable and unjust, with the result that the railroads are greatly handicapped. Their expenses have been increased, their revenue reduced, their credit weakened, and the investing public have grown afraid of their securities; not only on account of the reduced earnings, but because they are the target of so much legislation by both parties in many states.

There is no doubt that this is largely due to a lack of correct information as to the relation which the railroads bear to the general business of the country. It is the principal aim of this association to inform properly the general business public, the investing public, and that great army of mechanics, clerks and other employees, who, though not directly connected with the railroads, are enormously affected by the railroad situation.

Heretofore the only information presented to them through public channels has been every kind of statement which possibly could be derogatory to the methods and management of the railroads; so that it is not strange that a prejudice exists among the general public.

There is, therefore, a large field for this association on the following lines, namely:

To show the enormous value the railroads have been in the development of the country in the last thirty years, particularly in the West and South, and the benefits derived therefrom in which the rest of the country has participated.

Next, to show what a large increase has been made in the taxation of the railroads, compared with their increase of capitalization; to show that if the terminals are considered at what they would cost to-day, there is no railroad in the country which is not capitalized at a low value, and that the oft-repeated claim that they were asking higher rates to pay dividends on watered stock is not well founded.

And then, principally, the organization is formed to show to the public at large the great volume of business which the railroad companies themselves furnish. They distributed over $1,000,000,000 in the last good year in wages. They purchased also over $1,250,000,000 worth of manufactured material of all kinds, made up principally from iron, coal and wood, iron ore being worth 25 cents in the ground, soft coal 10 cents unmined, and lumber $5 an acre in the tree; consequently the raw material represented in the material purchased by the railroads did not represent $250,000,000, but the other $1,000,000,000 was actual labor or wages.

This $1,000,000,000 was distributed among ourselves, as manufacturers of the raw material, and was in turn by us distributed to our workingmen and the handlers of the material which we used, and again this was distributed by our working people, plus the $1,000,000,000 paid to employees by railroads direct, to those who supplied the necessities of life to the workingmen. These might include every kind of business, and they again distributed those millions—for who can say that any part of these thousands of millions of dollars did not in some way affect his business?

It is part of our plan to show that if the railroads employed 1,500,000 of men, there are as many more who are directly employed in furnishing their requirements.

We wish to point out what a large factor the profitable operating of the railroad is in the general business situation, and how, therefore, every one, no matter what his business or position, is more or less affected by it. A safe and strong condition of our railroads means the balance as between prosperity and the times that we have had for the last year; for undoubtedly the crippling of the railroads was the greatest factor in the recent depression.

We hope that on presenting this situation reasonably and fairly, setting forth the true condition of the railroads and their relations to the general business public, we shall so impress our legislators at large that they will need no argument to show them how carefully all legislation concerning railroads should be considered; not only because of its effect on the general business, but also its effect upon the general investing public.

We want the investor to feel sure that he is putting his money into a profitable investment, which, instead of being wrecked by legislation, is going to be encouraged and fostered. We want to point out to the small investor that here is a place where he can with reasonable safety get twice the return that he can from the savings banks, with almost equal security, either by purchasing the stock directly or from the fact that states will pass laws enabling savings banks and other institutions to invest in what will then be a safe security. The savings banks can thus, from their larger revenue, pay larger interest to their depositors, which certainly, under present conditions, they are not allowed to do by the laws. If the best method of railroad treatment is followed, there will be a reason for the states to allow savings banks or trust companies to invest in railroad stocks.

It is our purpose to spread this information directly through employees who form the association and also use our efforts to get other large employers of men to distribute it, on the ground that it is directly to their interest that a thorough knowledge of the general situation be disseminated. We have the conviction that this is all that is necessary, for wherever good business sense is applied there will always be just and proper legislation, and that is all we are asking.

We ask you to join us, whether directly connected with furnishing railroad material, or indirectly; not for the sake of the railroads, but for your own business interests, and the interests of your employees. Once they are reached there is no doubt of the immediate results; for when legislators realize how important the situation is, and how many are interested in it, there will be no question but what the railroads will receive fair treatment, be prosperous, and not only have abundant means for maintaining their properties at the highest standard of efficiency, which of itself will react in favor of all sorts of business, but also be enabled, by finding a ready market for their securities, to project and build extensions and new railroads; so that in the process of development in the country at large, particularly in the West—and the East will

derive its corresponding advantage—there will be an increasing amount of new cultivated land, new and enlarged cities, and a raising in the value of land. There has been such an increase on a vast acreage, from $1 an acre to $100 an acre within 25 years, and this is the particular object which we have in view. The railroads have been the real builders of this nation, and it is to our individual interest as well as the interest of the whole country that every man should do his best to assist and support them.

Every concern which deals with railroads will share the benefit of the work of the Railway Business Association, and should meet its share of the expense and of the work.

Will you join? If so, please fill out an application blank and send at once to GEORGE A. POST,

President Railway Business Association, 2 Rector street, New York.

William Banks' Record.

William Banks, of Spruce Creek, Pa., has been placed on the Pennsylvania Railroad's pension roll after a service of 50 years, during 25 years and 10 months of which he was night watchman at the Spruce Creek tunnels. The distance walked by the night watchman each night through the tunnels would be in round numbers about 12 miles. Basing it upon this average, the distance in 25 years would equal 113,100 miles. In recognition of faithful service, the road has presented Banks and his wife with an annual pass over the line.—*Press Despatch.*

Alaskan Heating Apparatus in New York (See ¶ 6).

Chairman Willcox, of the New York State Public Service Commission, has sent a letter to the New York City street railroads in which he says:

With the close of the summer season the Commission finds it necessary to emphasize certain matters requiring special efforts to obtain improvements. . . . The commission urges that such increased care be given to the operation of your lines as will afford the best service to the public with as little unnecessary friction or inconvenience as possible.

In accordance with the above suggestions the commission therefore asks your immediate attention to . . .

1. Inadequate service during non-rush hours.
2. Too protracted operation of open cars.
3. Irregular headways of cars or trains.
4. Unnecessary transferring of passengers to "car ahead" or "car behind."
5. Lack of proper heat in cars.
6. Insufficient ventilation, arising in part and in some cases from attempting to keep up the heat in cars by the presence of passengers.
7. Inadequate light in cars.
8. Lack of shelter on station platforms and at transfer points.
9. Smoking and spitting in stations and cars.

These were, during last fall and winter, prolific sources of complaints. . . .

Advancement for Ambitious Stenographers.

By looking over the officers of the Rock Island you can name many who were stenographers, and there is no reason why in 15 years, right here on the Rock Island, there should not be at least 10 or 15 more of our present stenographers and private secretaries filling official positions in the operation of the road. Many are not grasping the opportunity offered; they seem to be afraid of soiling their hands. * * * Talk with the switchman and the train and enginemen; you will find them very willing to tell you all they know about the railroad and its work. Notice how a switch is made and note the difference in the various kinds of frogs, and ask questions of everybody you see. When you hear of a wreck or washout, and it is possible to get to it, go, and note just how the wreckers pick up an engine or turn over a car. Watch the trainmaster or officer in charge of the work and see just what his duties are. Be a mixer.

Instead of going to the ball game every Saturday afternoon, take one or two half days and go out over the railroad and get acquainted with the locations of various stations, side tracks, etc. I am leaving the service of this company after six years' service, but the Rock Island cannot stop my taking with me one thing—the experience I have gained; neither have they enough money to offer me for my experience during a recent four-weeks on the Choctaw District, where I learned the manner of fighting washouts.—*Rock Island Employees' Magazine.*

Up to the Trades Union.

At a conference between capital and labor, summoned by Sir Christopher Furness, head of the shipbuilding firm of Furness, Withy & Co., and also of the Furness line of steamers, held recently at West Hartlepool, Sir Christopher told the delegates that it was impossible to carry on the shipbuilding business of the firm unless the incessant friction with the employees could be stopped. He therefore invited the representatives of all the trades unions connected with the industry to meet him to hear certain proposals.

These, briefly condensed, were:

First, that strikes must cease or the works would be closed.

Second, if the trades unions thought they could carry on the business themselves the firm was willing to sell out at a price to be fixed by assessors.

Third, if the unions would not buy, the firm was willing to admit its workmen as partners on a profit sharing basis.

Fourth, that a council be formed to settle all disputes, or refer them to accredited arbitrators.—*Despatch in New York Sun.*

Deep Waterway Convention at Chicago.

The annual convention of the Lakes-to-the-Gulf Deep Waterway Association was held in Chicago last week. Among the speakers were James J. Hill, Chairman of the Great Northern, and Theodore P. Shonts, President of the Chicago & Alton and the Toledo, St. Louis & Western. Mr. Hill discussed "The Future of Rail and Water Transportation." Mr. Shonts in his remarks, criticized certain phases of government regulation of railroads. There was danger, he said, that capital would be scared away from railroads by the fear of investors that the management of their properties would be taken out of the trained hands which now direct them and placed in charge of men who know nothing about railroad operation, have no financial responsibility, and are accountable to no one but the man who appoints them or to the political organization that gets them appointed. He condemned the principle of operation of railroads by commissions as "a grievous and vicious wrong," and said that in preference to this anomalous condition he "as a railroad man would prefer governmental ownership and operation of the railroads, dangerous as that would be for the maintenance of our liberty."

The convention adopted lengthy resolutions. The resolutions declare "the all-important question of transportation is a paramount issue" and continue in part:

"This convention does, therefore, declare the opening of a deep channel way connecting the great lakes on the north with the Gulf of Mexico on the south to be an imperative duty of the general government, and that this work should be immediately begun and completed as speedily as possible.

"Any plan for the inland waterway development so imperatively necessary to the rational welfare of the valley should comprise a main trunk line in the form of a strait connecting Lake Michigan with the Gulf of Mexico by way of the Illinois and Mississippi rivers. The development of this trunk line should begin at once. The improvement of the branches of this main line, such as the upper Mississippi with its tributaries, the Ohio with its leading tributaries, includng the Tennessee and Cumberland, the Missouri, the Arkansas, the Red, the White and other rivers, and the interstate inland water way of Louisiana and Texas, should proceed simultaneously with the development of the principal line."

Strike of Iowa Central Shop Employees Ended.

The strike of employees in the shops of the Iowa Central, which began on April 22, was ended on October 12. About 300 men at Albert Lea, Minn., Mason City, Oskaloosa, Marshalltown and Hampton, Ia., and Monmouth, Ill., are affected. According to newspaper reports, the settlement is a compromise. The strike was caused by a proposed cut in wages. Machinists, first-class, under the settlement, receive 37 cents an hour. Before the strike, they were getting 40 cents, and it was proposed to reduce them to 36 cents. Boilermakers, first-class,

receive 38 cents. They were getting 41½ cents, and it was proposed to reduce them to 37 cents. Carmen receive 1 cent per hour more than they were offered at the time of the strike, and their wages will range from $2.86 per day for expert car carpenters down to $1.96 for car repairers. The blacksmiths' schedule will be the same as before the strike. The men agree to work for 60 days with the non-union employees that the company has under contract. After that the shops will be "closed" shops.

It is said that the shops will hereafter be run to their full capacity with both night and day shifts.

Rio de Janeiro Docks.

Plans have been made for building at Rio de Janeiro, Brazil, 10 miles of docks in addition to the two miles now under contract. The additional facilities will consist of three piers, 1,115 ft. from each other, built at right angles to the shore to the north of the docks already under contract. The latter have a curved frontage on the bay without slips or piers. It is estimated that the three piers will cost about $19,500,000. The docks now being built are owned by the government, which is to lease them to private concerns, who will manage them under government regulations.

New York Railroad Club.

At the meeting of the New York Railroad Club to be held October 16, 1908, a paper on Heat Accumulation in Steam Engineering is to be presented by L. A. Battu.

Traffic News.

The Pennsylvania Railroad, according to a despatch from Philadelphia, now has about 50,000 idle cars, which compares with about 92,000 last spring.

The transcontinental lines have decided to make a round trip rate of $50 from St. Paul, Minn., and Missouri river points for the Alaska-Yukon-Pacific exposition at Seattle next summer.

A new form of six-for-a-quarter tickets are to be issued by the Philadelphia Rapid Transit. The new ticket is non-transferable and its coupons are good for fare only when detached by the conductor.

Local shippers in Portland, Ore., are quoted as saying that four freight steamers now operated by the Pacific Mail Steamship Co. will, at the expiration of their charters early next year, be released and will then be operated by the Hamburg-American line.

The transcontinental lines have decided to continue to grant half-fare rates to representatives of the Salvation Army. The law department of one of the roads had given an opinion that reduced clergy rates for members of the Salvation Army were of doubtful legality.

The Chicago, Milwaukee & St. Paul is said to have decided that when its Pacific extension is completed the company will file tariffs showing separately its rail and steamship rates on Oriental business. The Canadian Pacific, it is said, is about to do the same.

Attorney-General Hadley, of Missouri, in the cases before the federal court at Kansas City concerning the 2-cent passenger-fare law and the maximum freight rate law of that state, will have the assistance of an expert who has been sent to his aid by the Interstate Commerce Commission.

The Grand Trunk has acquired the car ferry steamer Manistique and will hereafter carry freight cars across Lake Michigan between Milwaukee and Grand Haven twice daily instead of once a day as heretofore. The Manistique has room for 32 freight cars. The boat will be renamed the Milwaukee.

Judge Smith McPherson, of the United States Circuit Court, on October 5, at Kansas City, Mo., postponed to November 9 final hearing in the suits brought by 18 railroads in Missouri to restrain the Attorney-General and the Railroad Commission of Missouri from enforcing the reduced freight and passenger rate laws in that state.

According to reports from Little Rock, passenger rates in Arkansas are to be increased from 2 cents a mile to 3 cents. Large increases in freight rates were recently made. These changes are the result of the decision enjoining the railroad commission from putting into effect certain rates. The new rates will be in effect pending the final hearing of the case.

A freight traffic official of the Illinois Central is quoted as saying that cotton has not been moving freely because of the scarcity of orders for export, Lancashire mills and Manchester mills having closed down. Movement of cotton from New Orleans has not been as large as it should have been, although the business handled so far is greater than for the corresponding period of last year.

United States Senator Charles A. Culberson, of Texas, has written to Allison Mayfield, Chairman of the Railroad Commission of Texas, that he has been in communication with Charles J. Bonaparte, Attorney-General of the United States, and understands that steps may be taken to prosecute under the Sherman anti-trust law the railroads that have advanced interstate rates to points in Texas.

The new steamer Brazos of the Mallory Line made such good time as to break records, both all-rail and rail-and-water, in the delivery of freight from New York via Galveston, that was consigned to Dallas, Fort Worth and other north Texas cities. The time of the Brazos from New York to Galveston was four days 19 hours and five minutes, which is understood to be two hours faster than the previous record.

The Brook-Rauch Mill & Elevator Company, of Little Rock, Ark., has brought suit in the federal court at Little Rock against the St. Louis, Iron Mountain & Southern for $55,000 damages. The complainant alleges that the Iron Mountain discriminated against it in favor of T. H. Burch and the T. H. Burch Company by giving to the latter a rebate of 1¼ cents on all grain handled through elevators, and refusing to give the same rebate to the Brook-Rauch company.

President Harahan, of the Illinois Central, is quoted as saying, regarding the company's order for 681 steel gondolas, that he believed that there would be a car shortage this season in some sections, although not to anything like the same extent as during last year and the year before. An Indianapolis, Ind., despatch says that freight officials there are expecting car shortage within 30 days. In the week ended October 10, 29,452 cars, of which 22,961 were loaded, were received and forwarded at Indianapolis. This compares with 24,939 in 1907 and 23,829 in 1906.

In the annual report of the Cincinnati, Hamilton & Dayton the receiver says that the present freight rates, considering the high cost of operation, proved inadequate for the service performed. He attributed the falling off in passenger earnings to the 2-cent fare laws in Ohio, Indiana and Illinois. In Indiana, passenger revenue decreased $63,123, or 16.55 per cent., the number of passengers having decreased 8.79 per cent. In Illinois, although nearly 56,000, or 13.4 per cent., more passengers were carried than in the year before, the decrease was $20,891, or 11.2 per cent.

Judge Kohlsaat, of the United States Circuit Court, at Chicago, has refused to issue a preliminary restraining order to prevent the Illinois Central and Louisville & Nashville from putting into effect changes in their rates on cottonseed oil, cottonseed foods and tank bottoms. Application for the restraining order was made by 13 shippers and brokers of Memphis, Tenn. The rates complained of are on shipments to Ohio river and Chicago points and to points east of the Allegheny mountains. The rates north are an increase of 2 cents and the rates east an increase of 5 cents per 100 pounds. Judge Kohlsaat told the petitioners that they should apply to the Interstate Commerce Commission for relief.

A press despatch from Mexico City, Mex., says that American coal and coke exporters, who do a heavy business in Mexico, are making strong protests before the Government Railway Commission against the proposed advance in freight rates on coal imported into Mexico. The object of the advance in rates is to protect and stimulate the coal and coke

industry in Mexico. Not only are the foreign exporters of coal and coke offering opposition to the proposed advance in rates, but the mining and smelting interests of Mexico are opposed to the changes, the grounds for their opposition being that they would have to pay higher prices for the products should foreign shipments cease and competition from that source end.

National Industrial Traffic League.

The annual meeting of the National Industrial Traffic League was held in Chicago on October 8. The action of the League regarding the uniform bill of lading is referred to elsewhere. Among the recommendations for federal legislation made by the legislative committees and endorsed by the League, were the following:

An act to provide that the shipper shall have the right and privilege to route his shipments and that when the shipper does not prescribe over what connecting lines the goods shall be transported, it shall be the duty of the initial carrier to collect only the lowest rate published between points of origin and destination.

An amendment to the Interstate Commerce Act to provide that officers or agents of the carriers shall quote rates in writing upon application and be responsible therefor, and give rates upon bills of lading and be responsible therefor, and that reparation for errors shall be made only by claim through the Interstate Commerce Commission; and, also, that the carrier whose agent shall quote a rate less than the legal rate shall be fined an amount equal to its entire earnings on the traffic carried at the lower rate.

An amendment to the Interstate Commerce Act to empower the Commission, in its discretion, to restrain an advance in rates upon the application of any shipper.

An act to amend the Sherman anti-trust act so as to permit officers of railroads to meet and confer regarding rates, provided that the right of the carrier to take individual action be preserved; that the dockets of meetings of traffic associations be recorded and shippers be informed of such matters as may be of interest or prejudicial to their business; that traffic associations be under the supervision of the Commission; that the Commission shall have power to annul any act of a traffic association that it deems contrary to public policy, and that neither pooling of tonnage nor revenue of carriers shall be permitted.

Traffic Club of Chicago.

The first monthly luncheon of the Traffic Club of Chicago was given at the Grand Pacific Hotel on October 7. The speaker was Joseph E. Ransdell, Representative in Congress from Louisiana and President of the National River and Harbor Congress. His subject was "Water Transportation." Mr. Ransdell gave a good many statistics by which he sought to show the greater cheapness of water transportation as compared with rail transportation. He said in part:

"Fifty-eight million tons of freight passed through the Sault Ste. Marie canal last year at a cost of $38,000,000. or eight-tenths of a mill per ton mile. If this freight had been carried by rail at the average rate of 7.59 mills per ton mile, the cost would have been $363,000,000. The saving by the Soo canal, therefore, was $325,000,000.

"On the Ohio river, that passes through the Pittsburg district, the commerce last year was over 13,000,000 tons. If this freight had been carried by rail the rates would have been 10 times as much between Pittsburgh and Louisville and 11 times as great between Louisville and New Orleans.

"The total commerce moving through the lakes and rivers of the United States last year amounted to 73,000,000,000 ton miles, costing $78,000,000, as compared with 238,000,000,000 ton miles carried by rail at a cost of $1,795,000,000. According to the amount, the freight carried by water ought to have cost about one-third of that hauled by rail. As a matter of fact, it cost only one twenty-third of the railroad rate.

"The railroads ought to co-operate with the waterways, but have they done so? No. Rates have been put so low at the points of water competition that the owners of the boats, who are usually men of small means, have been put out of business because the railroads are powerful corporations that can afford to lose at the water points and recuperate on the rates to the interior.

"The heavy freight boats often make 200 miles per day. The boat moves more slowly than the railroad trains as in the case of the race between the tortoise and the hare, but it gets there just the same, while the railroad car sleeps by the way."

The remedy for these conditions, Mr. Ransdell said, is to improve the waterways and leave to them the hauling of low grade, bulky commodities, and to have the railroads improve their facilities for handling high grade merchandise.

Besides members of the club, the luncheon was attended by numerous prominent men who were attending the Deep Waterways convention in Chicago. The President of the club, George H. Ingalls, presided.

General Crop Conditions on October 1.

The following table gives the average yield, condition or production of various crops as reported by the bureau of statistics of the United States Department of Agriculture on October 1, with comparisons. Condition reports on crops that were harvested before October 1 refer to condition at time of harvest. Estimates of production are on a basis of 100 representing a full crop. All figures for September 1 represent condition at that date.

Crops.	October 1. 1908.	October 1. 1907.	10-yr. average.	Condition Sept. 1, 1908.
Apples, condition	48.4	33.8	52.9	52.1
Barley, per acre, bush	25.0	23.8	25.5	81.2
Barley, quality	89.3	88.2	87.6	....
Beans (dry), production	79.0	79.1	....	82.8
Broom corn, production	76.8	85.1	....	76.6
Buckwheat, condition	81.6	80.1	81.8	87.8
Cabbages, production	73.5	83.5	....	80.3
Clover seed, production	90.8	64.9	....	89.7
Corn, condition	77.8	78.0	79.7	79.4
Cotton, condition	69.7	67.7	67.6	76.1
Cranberries, condition	58.3	77.8	....	67.7
Flaxseed, condition	81.2	78.0	83.6*	82.5
Grapes, condition	83.9	81.8	83.6†	84.6
Hemp, production	75.2	86.6	....	73.0
Hops, per acre, lbs.	1064.8	1114.0	1066.0	79.3
Hops, quality	92.6	90.6	93.3*	....
Kafir corn, forage, product'n	83.9	84.0	....	85.1
Millet, hay, production	86.1	83.1	....	86.9
Millet, seed, production	79.1	81.8	....	....
Oats, per acre, bush	24.9	23.7	29.8	69.7
Oats, quality	81.3	77.0	86.1	....
Onions, production	83.4	86.7	....	85.8
Peanuts, condition	85.4	84.7	....	86.0
Potatoes, conditioned	68.7	77.0	76.3	73.7
Rice, condition	87.7	88.7	87.7	93.5
Sorghum, condition	84.3	80.4	....	85.5
Sugar beets, condition	85.4	90.5	....	86.0
Sugar cane, condition	89.6	91.9	88.0	91.3
Sweet potatoes, condition	85.5	82.7	83.1	88.7
Tobacco, condition	84.1	84.8	83.5	84.3
Tomatoes, production	80.2	86.4	....	82.5
Watermelons, production	79.7	75.2	....	80.8
Wheat (sp'ng) pr acre, bush	13.2	13.2	13.8‡	77.6
Wheat (spring) quality	88.1	88.8	85.9‡	....

*Five years. † Four years. ‡ Six years.

Preliminary estimates of total production of such crops as have been reported on up to the present time are given below with last year's final estimates for comparison. Estimates for 1908 are subject to revision when final results are published in December.

Crop.	1908	1907
Winter wheat, bush	425,940,000	409,442,000
Spring wheat, bush	233,090,000	224,645,000
Total wheat, bush	659,030,000	634,087,000
Oats, bush	789,161,000	754,443,000
Barley, bush	167,242,000	153,597,000
Rye, bush	30,921,000	31,566,000
Hay, tons	67,743,000	63,677,000

The following table shows for the United States and different sections the average condition on dates indicated, or at time of harvest, of 17 important crops, representing nearly 90 per cent. of value of all farm crops, weighted according to their relative importance:

States.	Per cent. 1908. Sept. 1	1908. Oct. 1	1908. Decline.	1907. Sept. 1	1907. Oct. 1	1907. Decline.	10-yr. average. Sept. 1	10-yr. average. Oct. 1	10-yr. average. Decline.
United States	79.7	77.8	1.9	78.2	76.7	1.5	80.6	79.4	1.2
North Atlantic	82.7	81.7	1.0	80.2	81.0	0.8*	84.6	83.9	0.7
South Atlantic	82.1	79.0	3.1	83.2	81.9	1.3	80.0	77.1	2.9
North Central.†	76.5	75.7	0.8	78.2	77.6	0.6	82.2	82.0	0.2
North Central.‡	79.4	77.3	2.1	76.1	72.4	3.7	79.4	79.3	0.1
South Central	79.9	76.5	3.4	74.2	72.1	2.1	76.8	73.3	3.5
Far Western	81.9	83.0	1.1*	88.2	91.0	2.8*	87.6	87.4	0.2

*Advance. †East of Mississippi river. ‡West of Mississippi river.

REVENUES AND EXPENSES OF RAILROADS.

MONTH OF AUGUST, 1908.

Name of road.	Mileage operated at end Aug., 1908.	Operating revenues			Operating expenses						Net operating revenues (or deficit).	Outside operations,	Taxes.	Operating income (or loss).	Increase (or dec.) comp. with 1907.
					Maintenance										
		Freight.	Passenger.	Total, inc. misc.	Way and structures.	Of equipment.	Traffic.	Transportation.	General.	Total.					
Atchison, Topeka & Santa Fe	7,470	$4,080,452	$1,552,265	$6,090,216	$751,035	$1,110,033	$116,088	$1,580,575	$124,765	$3,682,496	$2,407,720	.....	$266,092	$2,141,628	$102,843
Boston & Maine	2,242	1,738,063	1,533,999	3,519,391	467,488	306,743	39,443	1,374,560	68,671	2,256,905	1,262,486	$19,379	137,136	1,144,730	‡294,229
Buffalo, Rochester & Pittsburgh	568	485,881	97,302	616,523	104,522	154,921	8,199	177,549	13,341	458,532	157,991	104	15,000	143,095	‡158,530
Central of New Jersey	668	1,225,168	436,565	1,751,433	192,104	310,834	27,657	464,969	36,218	1,031,782	719,651	122,104	87,847	753,908	‡247,973
Chesapeake & Ohio	1,894	1,750,246	453,097	2,292,904	290,062	399,762	35,185	579,667	41,368	1,346,044	946,860	3,820†	65,900	877,140	‡122,478
Chicago & Alton	998	657,220	400,542	1,150,975	101,640	111,441	37,262	311,114	28,846	590,323	560,652	79,859†	30,000	450,793	50,901
Chicago, Milwaukee & St. Paul	7,516	3,589,051	1,348,783	5,339,460	753,690	587,588	99,435	1,771,952	78,364	3,291,029	2,048,431	31,308	197,543	1,882,195	‡101,747
Chicago, Rock Island & Pacific	7,402	2,980,567	1,763,188	5,039,762	701,369	632,573	106,000	1,704,548	118,060	3,262,550	1,777,212	3,679†	186,775	1,586,758	129,319
Cincinnati, Hamilton & Dayton	1,036	495,428	183,153	728,443	85,043	132,732	20,245	275,922	18,560	532,502	195,941	5,019	25,658	175,302	‡4,455
Delaware & Hudson	845	1,144,945	378,180	1,566,458	153,107	170,403	16,723	514,255	34,188	888,676	677,782	2,166	35,000	644,948	‡208,878
Delaware, Lackawanna & Western	893	1,781,392	666,889	2,616,370	358,621	348,842	47,194	733,700	46,296	1,534,653	1,081,717	3,575	112,800	972,492	‡481,569
Galveston, Harrisburg & San Antonio	1,343	601,066	177,876	816,610	80,952	89,908	18,924	346,197	26,993	562,974	253,636	2,718†	18,985	231,933	64,268
Great Northern	6,672	3,120,552	1,075,671	4,460,471	1,144,825	563,478	52,884	1,181,329	76,670	3,019,186	1,441,285	38,936	196,022	1,284,199	‡904,466
Illinois Central	4,509	2,825,562	1,062,481	4,398,632	672,519	1,192,474	93,097	1,478,505	88,201	3,524,796	873,836	226†	192,990	680,619	‡203,352
International & Great Northern	1,160	379,213	156,970	580,458	93,070	107,411	15,172	244,758	19,385	479,796	100,662	.....	23,000	77,662	63,616
Lehigh Valley	1,446	2,285,010	463,104	2,833,933	281,023	567,989	62,550	799,137	59,371	1,770,070	1,063,863	12,613†	85,600	965,650	‡434,113
Minneapolis, St. Paul & S. S. Marie	2,310	561,654	287,305	903,675	118,515	106,696	16,731	316,353	21,829	580,125	323,550	31,718	62,488	292,780	‡6,540
Missouri, Kansas & Texas	3,072	1,440,433	638,839	2,200,770	288,689	357,517	46,203	731,846	60,293	1,484,548	716,222	2,272†	114,700	599,250	‡250,267
Mobile & Ohio	926	510,479	118,256	739,118	93,138	96,786	29,347	270,310	27,264	516,845	222,273	7,106†	16,100	199,067	‡47,560
Nashville, Chattanooga & St. Louis	1,230	574,608	242,721	878,610	112,829	167,200	34,248	312,818	23,702	650,797	227,813	51	20,000	207,864	‡3,824
New York, Chicago & St. Louis	553	576,566	154,230	755,804	89,002	84,579	45,880	286,074	12,211	517,747	238,057	33	28,000	210,090	‡18,831
New York, New Haven & Hartford	2,004	2,017,160	2,144,227	4,528,132	563,892	495,072	24,949	1,799,295	91,438	2,974,646	1,553,486	100,273	278,000	1,375,759	‡662,223
New York, Ontario & Western	546	522,878	292,402	844,383	90,266	111,393	9,335	251,316	13,366	475,676	368,707	1,269	15,417	354,560	‡48,654
Northern Pacific	5,649	3,804,818	1,699,480	5,836,668	823,990	701,738	70,212	1,558,258	81,174	3,235,373	2,601,295	56,771	233,467	2,424,599	‡456,534
Pennsylvania Company	1,414	2,771,083	673,296	3,733,766	300,136	523,436	57,009	1,137,029	69,432	2,087,042	1,646,724	909	127,430	1,520,203	‡286,883
Pere Marquette	2,356	711,096	397,935	1,201,032	144,127	175,766	28,403	442,734	28,717	819,747	381,285	4,057	52,334	333,008	‡13,249
Pittsburgh, Cin., Chic. & St. Louis	1,472	1,767,960	638,229	2,695,349	270,693	441,108	58,044	897,784	54,424	1,722,053	973,296	657†	106,510	866,129	‡143,415
Seaboard Air Line	2,611	678,835	268,294	1,060,634	181,813	178,008	41,419	402,942	43,597	847,779	212,855	886†	50,500	161,469	‡91,084
Southern	7,294	2,393,470	1,362,558	4,099,166	521,755	584,353	96,105	1,439,168	131,436	2,772,817	1,326,349	10,404	161,559	1,175,194	258,535
Union Pacific	3,301	2,987,915	932,930	4,232,439	521,703	369,264	79,150	883,822	81,855	1,935,794	2,296,645	99†	107,662	2,188,884	607,763
Vandalia	829	449,532	214,498	745,061	114,177	113,262	22,041	271,395	17,193	538,068	206,993	.....	25,283	181,710	‡30,208
Wabash	2,515	1,472,127	737,339	2,376,978	230,014	289,758	61,366	818,653	62,035	1,461,826	915,152	1,440	72,674	843,918	‡118,036
Wisconsin Central	1,023	449,831	181,160	669,471	80,574	68,885	23,838	209,627	18,081	401,005	268,466	1,805	29,085	241,186	1,385
Yazoo & Mississippi Valley	1,371	385,795	175,020	600,144	189,666	115,098	15,201	277,340	20,851	618,156	18,012*	3,487	34,590	49,115†	‡74,112

MONTHS OF JULY AND AUGUST, 1908.

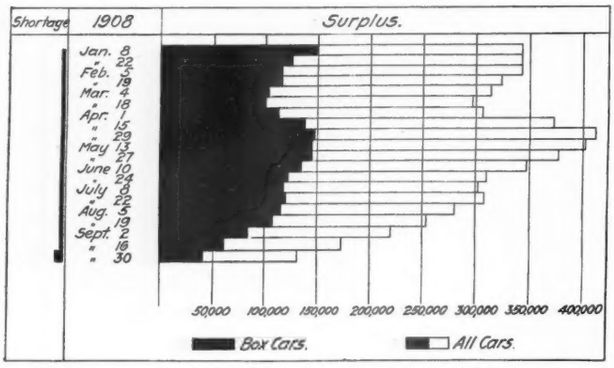
Atchison, Topeka & Santa Fe	7,470	7,824,973	3,092,154	11,851,691	1,478,666	2,113,133	226,392	3,120,568	239,461	7,178,220	4,673,471	.....	532,183	4,141,288	‡142,661
Boston & Maine	2,242	3,439,155	2,845,930	6,794,513	874,238	678,392	82,558	2,767,657	139,193	4,542,037	2,252,476	28,646	274,271	2,006,851	‡507,481
Buffalo, Rochester & Pittsburgh	568	1,012,687	189,305	1,270,094	184,458	323,382	17,210	357,364	26,462	908,876	361,218	92†	30,000	331,126	‡279,985
Central of New Jersey	668	2,381,860	862,434	3,432,956	366,196	620,740	56,937	950,712	72,225	2,066,811	1,366,145	245,434	175,284	1,436,295	‡462,422
Chesapeake & Ohio	1,894	3,345,475	862,934	4,388,036	552,065	769,280	72,868	1,133,652	82,859	2,610,724	1,777,312	2,879†	131,800	1,642,833	‡137,507
Chicago & Alton	998	1,285,552	745,739	2,208,011	189,493	216,968	71,040	599,492	54,376	1,131,369	1,076,642	107,985†	60,000	908,657	218,221
Chicago, Milwaukee & St. Paul	7,516	6,573,326	2,613,491	9,991,869	1,266,571	1,099,405	202,020	3,433,989	164,195	6,166,180	3,825,689	75,536	395,086	3,506,139	‡398,468
Chicago, Rock Island & Pacific	7,402	5,626,509	3,244,117	9,450,132	1,470,401	1,219,025	214,982	3,404,010	245,746	6,554,164	2,895,968	10,577†	333,544	2,551,847	69,630
Cincinnati, Hamilton & Dayton	1,036	948,651	337,035	1,383,346	169,142	263,933	44,082	547,515	39,770	1,064,442	318,904	7,818	50,658	276,064	‡30,767
Delaware & Hudson	845	2,270,094	684,328	3,042,947	299,210	339,303	48,077	1,033,461	66,369	1,786,420	1,256,527	2,552	70,000	1,189,079	‡345,128
Delaware, Lackawanna & Western	893	3,824,237	1,304,443	5,475,609	742,632	715,997	101,744	1,494,655	96,330	3,151,358	2,324,251	4,845	225,600	2,103,496	‡623,878
Galveston, Harrisburg & San Antonio	1,343	1,087,890	353,238	1,521,369	168,602	176,823	36,726	653,550	55,035	1,090,736	430,633	3,147†	59,675	367,811	108,476
Great Northern	6,672	6,248,332	2,136,466	8,910,965	2,423,410	1,090,048	105,654	2,270,256	169,872	6,059,240	2,851,725	73,031	353,315	2,571,441	‡1,759,543
Illinois Central	4,509	5,369,984	2,014,220	8,389,088	1,295,295	2,080,080	188,539	2,959,872	182,406	6,706,192	1,682,896	219	375,598	1,307,517	‡591,836
International & Great Northern	1,160	700,579	294,781	1,082,969	192,341	199,283	28,383	474,921	38,636	933,564	149,405	.....	46,000	103,405	112,212
Lehigh Valley	1,446	4,307,183	879,193	5,360,384	570,384	1,031,668	125,734	1,579,284	112,255	3,419,325	1,941,059	41,449†	171,200	1,728,410	‡950,833
Minneapolis, St. Paul & S. S. Marie	2,310	1,137,914	578,108	1,818,426	244,415	213,901	35,513	597,216	42,800	1,133,845	684,581	63,988	124,245	624,324	‡15,737
Missouri, Kansas & Texas	3,072	2,635,868	1,188,823	4,069,037	552,390	678,769	92,102	1,488,413	124,747	2,936,422	1,132,615	2,240†	179,352	951,023	‡771,557
Mobile & Ohio	926	1,028,221	223,097	1,466,284	180,393	204,143	55,997	540,838	56,054	1,037,425	428,849	14,835†	32,200	381,824	‡91,074
Nashville, Chattanooga & St. Louis	1,230	1,170,497	470,481	1,758,909	222,381	336,893	72,761	647,301	44,115	1,323,451	435,458	561†	40,000	394,897	‡71,476
New York, Chicago & St. Louis	553	1,120,947	279,751	1,448,545	160,756	168,884	91,164	557,797	26,362	1,004,963	443,582	575†	56,000	387,007	1,544
New York, New Haven & Hartford	2,004	4,050,622	4,125,405	8,929,955	1,129,694	907,918	44,955	3,624,182	174,809	5,881,558	3,048,397	193,618	556,000	2,686,015	‡524,420
New York, Ontario & Western	546	1,064,394	535,448	1,661,296	177,747	232,885	19,684	504,463	26,948	961,727	699,569	5,010	30,833	673,745	‡56,392
Northern Pacific	5,649	7,458,231	3,392,932	11,516,193	1,571,199	1,363,465	154,881	3,082,453	166,462	6,338,460	5,177,733	88,440	460,648	4,805,525	‡1,061,897
Pennsylvania Company	1,414	5,457,662	1,285,690	7,323,786	599,179	1,043,370	121,809	2,282,267	141,087	4,187,712	3,136,074	83	249,490	2,886,667	‡458,840
Pere Marquette	2,356	1,327,766	747,640	2,258,248	288,025	354,150	57,883	872,702	56,383	1,629,143	629,105	5,097	104,690	529,512	‡81,956
Pittsburgh, Cin., Chic. & St. Louis	1,472	3,489,895	1,258,928	5,350,552	523,145	890,850	121,199	1,815,581	109,302	3,460,078	1,890,474	1,079†	209,845	1,679,550	‡130,239
Seaboard Air Line	2,611	1,468,257	542,069	2,246,987	335,495	384,990	82,576	833,958	87,305	1,724,324	522,663	2,081†	101,000	419,583	‡40,621
Southern	7,294	4,988,247	2,573,724	8,246,404	1,014,566	1,168,708	191,264	2,920,972	272,711	5,568,221	2,678,183	16,904	323,118	2,371,969	664,112
Union Pacific	3,301	5,646,730	1,885,318	8,145,273	1,020,827	761,784	154,842	1,703,440	178,992	3,819,885	4,325,388	1,381	215,325	4,111,444	853,626
Vandalia	829	885,715	406,120	1,449,987	230,414	225,942	41,461	533,649	33,413	1,064,878	385,109	.....	50,566	334,543	‡32,999
Wabash	2,515	2,804,260	1,316,139	4,454,956	461,674	609,239	130,997	1,589,402	121,000	2,912,312	1,542,644	2,162	135,928	1,408,878	‡235,473
Wisconsin Central	1,023	896,386	347,808	1,321,121	161,377	141,824	48,127	418,476	36,634	806,438	514,683	2,739	58,175	459,247	‡66,570
Yazoo & Mississippi Valley	1,371	734,070	341,550	1,154,573	381,413	227,160	31,697	569,845	44,479	1,254,594	100,021*	6,265	69,180	162,936†	‡200,026

*Deficit. † Loss. ‡ Decrease.

Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on car efficiency of the American Railway Association, in presenting bulletin No. 31-B, giving a summary of surpluses and shortages of cars from October 30, 1907, to September 30, 1908, says:

"There is a further decrease of 39,795 in the number of surplus cars, bringing the total down to 133,792. Of this decrease, 16,075 are box cars, and 17,096 coal and gondola. The improvement is most marked in Groups 2 (Eastern), 3 (Middle), 5 (Southern), and 11 (Canadian), the decrease on Canadian lines being equivalent to over 50 per cent. of the total surplus in this group. The large movement of grain in western Canada has also resulted in a shortage of box cars in this territory, which should, however, be only temporary. The shop reports indicate some further reductions in the number of bad order cars."



Car Surpluses and Shortages in 1908.

The accompanying table shows the surpluses and shortages for the period covered by the bulletin and for preceding periods. The diagram shows the surpluses and shortages for 1908.

Car Surpluses and Shortages, from October 30, 1907, to September 30, 1908, Inclusive.

		Surpluses.					Shortages				
	Number of roads.	Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
September 30, 1908	160	42,593	10,365	49,795	31,039	133,792	7,313	450	224	127	8,114
September 16, 1908	163	58,668	12,200	66,891	35,828	173,587	2,252	104	311	268	2,935
August 19, 1908	160	106,367	13,494	92,500	40,642	253,003	465	90	105	194	854
July 22, 1908	166	120,580	14,401	125,739	47,960	308,680	115	37	330	27	509
June 24, 1908	163	123,112	18,042	130,149	41,995	313,298	266	34	120	31	451
May 27, 1908	160	144,697	20,075	162,695	54,437	381,904	82	13	12	18	125
April 29, 1908	159	147,971	24,350	186,742	59,542	413,605	145	42	16	64	267
March 18, 1908	160	103,509	25,122	119,205	49,206	297,042	533	151	250	73	1,007
February 19, 1908	161	113,776	30,088	134,217	44,432	322,513	697	141	249	162	1,249
January 22, 1908	161	124,622	27,328	142,388	48,292	342,580	392	132	79	135	738
December 24, 1907	158	87,714	14,740	64,556	42,300	209,310	187	81	191	265	724
November 27, 1907	160	16,246	3,645	10,028	10,429	40,348	11,908	868	2,964	2,224	17,964
October 30, 1907	161	786	600	1,285	1,275	3,946	61,592	3,546	15,987	9,622	90,757

San Francisco to Avonmouth, England, Direct.

Owing to the efforts of the Bristol docks committee, following the opening of the new dock at Avonmouth, to increase the shipping coming here, the French Steamship Company, Chargeur Reunis, have decided to make Avonmouth a port of call for several of its steamers, on condition that a certain minimum quantity of canned or other goods is shipped from the United States to Bristol by each steamer. The first steamship scheduled to open the new service, the Admiral Magon, was to have left Seattle July 23 and San Francisco Aug. 8, to be followed, it is understood, by the Admiral Exelmans, booked to leave Seattle about the middle of September and San Francisco some 10 or 12 days later. On the success of the company in securing outward shipments of freight from the United States will depend the continuation of the service.

The dock charges at Avonmouth are exceedingly low, owing in part to the modern appliances installed there for the handling of freight, and the probabilities are that shipments may be made through Seattle, San Francisco, and other centers to various towns in the west of England quite as cheaply, and in some cases cheaper, than if the goods were sent direct in less capacious vessels. Fruit in cans, ores and other freight may be forwarded under conditions perhaps never before so favorable to the building up of trade between the Pacific slope and this section of the United Kingdom, and what is chiefly asked is that the American merchants interested continue to give the company the necessary minimum supply of cargo. If in addition American merchants in the West can provide some return cargo aiso, this new experiment, from which so much is hoped, may be made successful, and the service permanently established.—*Consular Report.*

Uniform Bill of Lading.

The Central Freight Association has issued a letter to the public explaining the position of the eastern roads as to the uniform bill of lading. The letter, after stating that the carriers on November 1 will adopt a new uniform bill of lading, combined with a new shipping order, reviews the negotiations between the roads, the shippers and the Interstate Commerce Commission that led to the recommendation by the Commission of the new bills of lading which were published in the *Railroad Age Gazette* of July 17 last, page 539.

A supply of standard railroad forms will be furnished to shippers upon request. Shippers for their own convenience may print on these forms lists of commodities at their own expense. Continuing, the letter says:

"Forms of bills of lading prepared by shippers for use on and after November 1, 1908, must contain the precise language of the new contract and conditions, and must conform to the requirements in respect to color distinction for 'order' shipments and 'straight' shipments. It is appreciated that in order to meet the particular requirements or convenience of business certain exceptions in non-essential features from carriers' forms may be necessary in the shippers' forms. These exceptions should, however, be approved by carriers before being adopted. Under no circumstances can any variation be made in the general requirements, such as the title of respective bills of lading, the color to govern each, the provision for shipper's signature and the precise language and arrangement of the contract and conditions.

"The division into two forms, one of which is white (that for 'straight' consignments) and the other in colors, yellow (form for order bills of lading) and blue (shipping order and memorandum acknowledgment) was adopted to meet the unanimous belief that the order bill of lading should be of a distinctive character in order so far as possible to prevent fraudulent changes being made after the bill of lading is issued; and it was urged by both the shipping public and the bankers as a necessary safeguard to other commercial transactions, it being recognized that a straight bill of lading without any distinctive features could be fraudulently manipulated.

"It is the belief that this bill of lading, the result of three years of arduous negotiations between the shipping interests and the carriers with the benefit of advice from learned counsel and the banking interests of the country, who are vitally interested in the negotiability of the bill of lading, has resulted in a document which, as to its form, is so nearly perfect as to commend itself to every shipper. The great

importance of uniformity has been recognized throughout the period during which the bill of lading has been under consideration and by all parties in interest."

The Uniform Bill of Lading Committee of the Illinois Manufacturers' Association has addressed a letter to the public in which, after reviewing the negotiations leading to the agreement on the uniform bill of lading, it says:

"The committee believes that the great advantages gained warrant it in appealing to shippers for their co-operation in putting the uniform bill of lading into effect. The result is the best thought and effort that we can command, supported by able legal advice, together with the bankers of the country, who are interested in safeguarding the negotiable feature. It is a safe bill of lading and every shipper is urged to use it in forwarding freight."

The National Industrial Traffic League, at a meeting in Chicago on October 8, decided to withdraw its opposition to the uniform bill of lading. The resolution adopted refers to the decision of the western and southern lines to act with the eastern lines in putting the uniform bill of lading into effect, and after rescinding the resolution adopted at the recent meeting of the league in St. Louis, opposing the uniform bill of lading, continues:

"During such time as the uniform bill of lading is made obligatory by the action of the carriers we suggest that all shippers file with the secretary of this league their written protest to such features of the uniform bill of lading as their interests require or render necessary. This league reaffirms its belief in the justice and necessity of the simple bill of lading recommmended by it (*Railroad Age Gazette*, September 18, page 973), but cannot, by reason of conditions existing at this moment, safely conserve shippers' interests by urging its use at this time.

"We recommend that the executive committee formulate the objections to the uniform bill filed in pursuance to this recommendation and take action to have said objections considered by properly constituted authority.

"Resolved, That a protest be filed with the Interstate Commerce Commission against the action of the lines in official classification territory in coupling the 10 per cent. advance requirement with the use of the proposed bill, as we believe that action to be unreasonable and unwarranted.

"Resolved further, That we are opposed to the requirement by the lines in official classification or any other territory that shippers must not use any dray tickets or receipts other than the exact form prescribed in the bill."

While the National Industrial Traffic League has withdrawn its opposition to the uniform bill of lading, it objects to the requirement of the railroads that shippers must destroy their old drayage tickets or shipping receipts and provide new ones. A conference between representatives of the League and of the eastern railroads was held in Chicago on October 12, at which no agreement was reached. The following statement was made by the railroads:

"The carriers feel obligated to carry out the recommendation of the Interstate Commerce Commission. They do not think the expense to shippers on account of change in forms is a sufficient reason for them (the carriers) to ask the Interstate Commerce Commission for a change in its recommendation."

J. C. Lincoln, President of the National Industrial Traffic League, after the conference, wired to the Interstate Commerce Commission for a ruling upon the subject. The contention of shippers is that to destroy all the shipping receipts they have on hand will cost them many thousands of dollars, and that the requirements of the Interstate Commerce Commission will be met by stamping on their present receipts the words, "Subject to the provisions of the uniform bill of lading."

W. M. Hopkins, Manager Transportation Department, Chicago Board of Trade, has written a letter to J. F. Tucker, Chairman of the Central Freight Association, mentioning certain features of the uniform bill of lading that are objectionable to the grain trade. He criticizes the carriers for attempting to relieve themselves of responsibility for differences in weights of grain, seeds and other commodities caused by so-called natural shrinkage or discrepancies in elevator weights. He says that if there is a natural shrinkage in grain in transit, the carrier would not be responsible for loss of weight through it, and if it can be shown that there is no natural shrinkage the bill of lading cannot relieve the carrier of responsibility for loss of weight. The provision regarding discrepancies in elevator weights stands, he says, upon the same footing.

Another objection made is to the provision of the bill of lading that claims for loss or damage or for delay in transit shall be made at the point of origin or destination within four months. A carload of grain shipped from Omaha to Boston may be owned and shipped by a dealer in Chicago. It is unreasonable, Mr. Hopkins contends, to require claim for loss or damage in such a case to be presented at Omaha or Boston.

With reference to the four months provision, Mr. Hopkins says:

"It is not possible to conceive that any one could suppose that a provision in your bill of lading outlawing a legitimate claim against a railroad company unless presented within four months is good law or good sense . . . A claim against a railway is precisely like a claim against any other company or individual; it is only barred by the statute of limitations as provided by law."

Mr. Hopkins contends that the 10 per cent. penalty clause in the bill of lading is not legal, and concludes:

"No conditions that may be embodied in your bill of lading can add to or take away the rights of either the shipper or the carrier as defined by statutory or common law, and we, therefore, respectfully urge your companies to accept grain tendered to them for transportation on a clean receipt or a clean bill of lading, subject only to the rights of either the shipper or the carrier as provided by the law. Your insistence upon the use of this uniform bill of lading and your attempt to enforce a penalty if it is not used will involve the carrier and the shipper alike in needless disputes and litigation."

A number of railroad officers have made answers to the critics of the new form, among them Mr. D. T. McCabe, Vice-President of the Pennsylvania Lines West of Pittsburgh, a member of the Uniform Bill of Lading Committee. He says: "The new Uniform Bill of Lading will define the precise terms upon which any shipment is made and will be of great value to a shipper in that he will not be compelled to consult a lawyer to ascertain his rights in case of loss or damage. This contract has been approved as eminently fair by the Interstate Commerce Commission; by a committee of shippers representing the Illinois Manufacturers' Association; the Millers' National Federation; the Ohio Shippers' Association, and the New York Produce Exchange.

"The conditions of the proposed form of bill of lading are not in all respects such as would have been framed by a committee composed entirely of the representatives of the carriers, nor do they enlarge the carriers' liability to the extent desired and insisted upon by the representatives of the shippers in the earlier stages of the discussion. Every condition was discussed at great length and vigorously fought over where there was any difference of opinion, and there were times, especially after all-day wrangles, which were extended into the hours when all good people were supposed to be abed, when even the most sanguine of our committee abandoned all hope of any agreement.

"Every proposition of the shippers was most carefully considered by our advisory counsel, all of whom were with us at some, and a majority of them at all, of the conferences, and any condition suggested by the railroads underwent the closest scrutiny of the shippers' able counsel, Mr. Mayer; and the proposed form represents the very best and conservative thought of both sides, and, on the whole, I think it is not unfair to the carriers; and it has been accepted by the representatives of the shippers as fair and reasonably satisfactory to the shipping public.

"There is one feature of the new uniform bill of lading which received the fullest discussion, and which should be exceptionally satisfactory to shippers. It is provided that when property is held in transit upon request of the owner, or when upon request of an owner property is carried in open cars, the carrier shall not be liable for damages except such as may be due to negligence, and it is specifically provided that the burden of proving freedom from such negligence shall be on the carrier. This is protection of great value to a shipper and has never been accorded before.

"When the terms of the new uniform bill of lading come to be thoroughly understood, we believe the shipping public will realize the value of the new document. Our advices are to the effect that shippers generally are arranging to use the new forms after November 1, and the carriers are preparing to withdraw all copies of the old forms from circulation on that date."

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Chicago, Rock Island & Pacific is in the market for 60 locomotives.

The Chicago, Milwaukee & St. Paul is to place contracts this week for 50 Prairie engines.

The Nashville, Chattanooga & St. Louis has ordered three locomotives from the Baldwin Locomotive Works.

The Lawton, Wichita Falls & Northwestern, J. M. Bellamy, President, Lawton, Okla., is in the market for locomotives.

Texas Roads, as noted in another column, have secured modifications of the State Railroad Commission's order requiring them to buy new equipment.

The Chicago & North-Western has ordered 15 Atlantic locomotives from the American Locomotive Co., and has also ordered 25 ten-wheel and 15 six-wheel switch engines.

The Mexican Central has ordered one compound locomotive from the Baldwin Locomotive Works. This order was erroneously credited to the Michigan Central in our last issue.

The Chicago & Alton will soon be in the market for 20 consolidation (2-8-0) locomotives and later expects to buy 10 additional locomotives, five of the latter to be switch engines.

CAR BUILDING.

The Colorado & Southern is asking prices on two dining cars.

The Illinois Central has ordered 681 fifty-ton, all-steel, drop bottom gondola cars from the Cambria Steel Co.

The Lawton, Wichita Falls & Northwestern, J. M. Bellamy, President, Lawton, Okla., is in the market for passenger cars.

Texas Roads, as noted in another column, have secured modifications of the State Railroad Commission's order requiring them to buy new equipment.

The Houghton County Traction Co., Houghton, Mich., has placed an order through the Stone & Webster Engineering Corporation, Boston, Mass., for four double-truck cars to be built by the J. G. Brill Co.

The South Manchurian Railroad has, according to a consular report, ordered 25 third-class passenger cars from the Locomotive Manufacture Company of Osaka, Japan. This road has heretofore bought most of its rolling stock in the United States.

The Chicago, Milwaukee & St. Paul was reported in our issue of October 2 as having ordered the building of 5,000 box cars of 50 tons capacity in its Milwaukee shops. The cars are of 40 tons capacity. The bolsters, trucks and underframes will be built by the Bettendorf Axle Co.

The Harriman Lines, as mentioned in the *Railroad Age Gazette* of September 4, have ordered from the Pullman Company 71 steel coaches, 77 steel baggage cars, 10 steel chair cars, 11 steel postal cars, 9 steel postal storage cars, 30 steel underframe diners and 12 steel underframe combination passenger and mail cars.

IRON AND STEEL.

The Alabama, Tennessee & Northern is in the market for 3,800 tons of 60-lb. rails.

The Harbor Land & Lumber Co., Manitou Island, Mich., has ordered 700 tons of heavy rails from the Illinois Steel Co. for immediate delivery.

The Sanoody Valley Railroad, through J. P. Hornaday & Co., New York, is asking bids on rails to be used in the construction of 12 miles of road.

The Northern Pacific has ordered 2,100 tons of structural steel from the McClintic-Marshall Construction Co., and 5,000 tons of rails from the Illinois Steel Co.

The Isthmian Canal Commission will receive bids until Nov. 2 for iron and steel sheeting, rails, angle bars, tie plates, rail braces, etc. (Circular No. 473.)

The Nezperce & Idaho (Electric) has ordered rails for the first 14 miles of the line it is building from Nezperce, Idaho, northeast to a connection with the Northern Pacific.

The Illinois Steel Co. has orders from the Illinois Central for 2,000 kegs of spikes; from the Missouri Pacific for 2,000 kegs, and from the Southern Pacific for 12,000 tons of continuous rail joints.

RAILROAD STRUCTURES.

Amarillo, Tex.—The Railroad Commission of Texas has approved the plans of the Ft. Worth & Denver City for a new passenger station.

Augusta, Ga.—It is said that E. L. Bemiss, Richmond, Va., President of the Augusta Construction Co., which company is building some connecting lines of the Georgia & Florida, is chairman of a committee which has been receiving concessions in the way of land and money for the location of new shops from the cities of Augusta, Ga., Douglass, Vidalia and Hazelhurst. (See Railroad Construction, Georgia & Florida, Aug. 28, p. 839.)

Beaumont, Tex.—The Southern Pacific lost by fire on October 7 its roundhouse and oil storage tank together with several engines. The loss is fully covered by insurance. It is said that the company will rebuild the roundhouse at once.

Brooklyn, N. Y.—Contracts have been let by the Brooklyn Rapid Transit for a sub-station on the south side of Thirty-eighth street, just west of Fifth avenue. It is to be one-story high, 60 ft. x 200 ft., built of pressed brick and terra cotta. It is to be completed in five months.

Denver, Colo.—The Union Pacific, the Burlington, the Colorado & Southern and the Denver, Northwestern & Pacific have approved plans and are asking bids for building the Twentieth street viaduct. The viaduct is to be completed by July, 1909, and will require 4,000 tons of steel. Herbert S. Crocker, 434 Empire building, is Consulting Engineer. (June 19, p. 200.)

El Dorado, Ark.—The Chicago, Rock Island & Pacific has given a contract to George B. Swift & Co., 188 Madison street, Chicago, for terminal facilities at El Dorado. The work includes an 11-stall round' ouse, 64-ft. steel turntable, 130-ft. circular pit, 115,000 gallon steel stand pipe, and 40-ft., 100-ton track scales.

Gary, Ind.—The Baltimore & Ohio has prepared plans in conjunction with the Lake Shore & Michigan Southern for a joint passenger station to be built at Gary. It will be a two-story structure, 70 ft. x 150 ft., of steel and concrete construction, will have pressed brick exterior and will cost, including train shed, about $200,000.

Metis River, Que.—Plans for the bridge of the Matane & Gaspe across this river have been completed.

Mobile, Ala.—An officer of the Louisville & Nashville writes that the company has started work on a brick passenger station, for which all the material is on the ground. The work is being done by the company's men.

Oklahoma City, Okla.—The Oklahoma Railway Co. expects to erect a new car barn and shops within the next 60 days. The buildings will be at Ollie and Second streets and will include a wood working shop, iron shop, paint shop and car barn. The improvements are estimated to cost $60,000.

Peshtigo, Wis.—The Wisconsin & Michigan is making arrangements to rebuild the car shops and storehouses which were destroyed by fire. The loss is said to have been about $25,000. The machine shop and roundhouse were not damaged.

St. Paul, Minn.—The Twin City Rapid Transit Co. has rejected all bids for constructing a three-story concrete fireproof storehouse at Snelling and University streets, St. Paul, and will build the structure with its own forces. It will be 100 ft. x 300 ft. and will cost $50,000.

Winnfield, La.—The Chicago, Rock Island & Pacific is com-

pleting plans for new terminals at Winnfield to cost $40,000. George B. Swift & Co., 188 Madison street, Chicago, have the contract.

WINNIPEG, MAN.—A contract for two freight sheds, 500 ft. x 40 ft. and 400 ft. x 60 ft., for the joint terminal facilities of the Grand Trunk Pacific and the Canadian Northern has been awarded to J. H. Tremblay & Co., of Winnipeg.

SIGNALING.

In the yards of the Washington Terminal Company at Washington, D. C., the emergency whistles are fixed, not on the signal columns, but on the signal bridges spanning the tracks. In case a signal is out of order, two short blasts are given as a signal for trains having correct signals to proceed. The whistles are also used to call repairmen, four short blasts being a call for them to report at the tower.

Simmen's Signaling System.

The Toronto & York Radial Railway, an electric road, has contracted for the installation, as an experiment, of the Simmen signaling apparatus, on the division between Toronto and Port Credit, covering about 10 miles. An application has been made for the incorporation of a Canadian company to manufacture the apparatus, and the proprietors propose to establish a factory in Toronto.

The Simmen devices are also being installed on 18 miles of the Atchison, Topeka & Santa Fe in southern California, between Highgrove and San Jacinto, Riverside county, where they have been in experimental use for several weeks. The system is what may be called a manually operated cab signal. By short third-rail connections at each station, signals are automatically sent to the despatcher's office by each passing train and are there automatically recorded on a sheet kept moving by clock work. Guided by this record, the despatcher admits trains to the successive block sections by sending electric impulses to the entrances of the blocks, a separate wire running to each point, and these impulses, acting through the third rail and a contact device on the engine, give a light signal in the engine cab. Mr. Simmen proposes also to have introduced an automatic stop.

New Automatic Signals on the Maine Central.

The Maine Central is putting up automatic block signals on 46 miles of its line, single-track, from Lewiston fair grounds to Waterville. The signals are two-arm, style B signals, made by the Union Switch & Signal Co., Swissvale, Pa., and in the 46 miles there will be 94 signals. With this work finished, the Maine Central will have 220 miles of its line equipped with automatic block signals. This includes 44 miles of double track. The longest piece of line heretofore signaled was that from Portland to Old Town, 147 miles. Some of the older signals have only a home arm, but the company will soon equip them with distant arms. Where distant signals are used, they are controlled by polarized relays. On the single-track lines of the Maine Central the block sections are about one mile long, the signals being staggered about 1,800 ft. in opposite directions. This also serves as an overlap for following trains, and in addition to that there is in one direction a preliminary section about 2,000 ft. long, thereby giving trains in one direction about 2,000 ft. advantage over trains in the opposite direction. This, with the 1,800 ft. stagger, prevents two opposing trains from getting a clear signal at the same time, and also acts as a longer overlap in the reverse direction.

SUPPLY TRADE NOTES.

The Cleveland Crane & Car Co., Wickliffe, Ohio, has changed its name to the Cleveland Crane & Engineering Co.

John W. Mute, President of the St. Louis Car Wheel Co., St. Louis, Mo., died in Portland, Me., on October 6, at the age of 47.

The corporate name of The Dodge Coal Storage Co., Philadelphia, Pa., has been changed to the J. M. Dodge Company. James M. Dodge, Chairman of the Link-Belt Company, Nicetown, Philadelphia, Pa., is President.

J. D. Edwards, who has been for a number of years in the sales and operating departments of the Western Electric Co., Chicago, has resigned to become Superintendent of Works of the Sterling Electric Co., Lafayette, Ind.

The Chicago Steel Car Co., Chicago, has been incorporated in Illinois with $50,000 capital stock to make and sell cars and steel and iron products. The incorporators are: Frank T. Winslow, I. L. Miller and S. B. McEldowney.

The Rail Joint Company, New York, has established a branch sales office in the Call building, San Francisco, Cal. James A. Greer, heretofore in the sales department in New York, will represent the company in San Francisco.

The Isthmian Canal Commission, Washington, D. C., is asking bids until November 2 on pipe, drills, cable, pneumatic and other hoists, milling cutters, geared cutters and other machine tools, hose, lubricants and lumber. (Circular No. 473.)

José M. Mendoza, Consulting Engineer, Filipinos No. 530, Apartado 1096, Lima, Peru, wants information, catalogues and, where possible, approximate prices of rolling stock and other equipment for steam and electric roads, both standard and narrow gage.

The American Waterproofing Co., New York, has acquired the Anti-Hydro waterproofing business and is prepared to sell this material in lots of five gallons and upwards, and to handle contracts of any description calling for general structural waterproofing. F. M. Hausling, Consulting Engineer, is manager of the waterproofing department.

The Whiting Foundry Equipment Co., Harvey, Ill., has just furnished the Standard Cast Iron Pipe & Foundry Co., Bristol, Pa., with two standard No. 12 cupolas. They are unusually large, having a capacity of 30 to 35 tons an hour. The shell is 108 in. in diameter, and wind box 130 in., with a 10½-in. lining. Each is fitted with two rows of tuyeres, eight in each row.

The International Railroad Supply Co. has been incorporated in Missouri to deal in steam and electric railroad supplies and all mechanical devices. The capital stock is $100,000, fully paid. The incorporators are Garrett Brown, P. P. Shaw, J. L. Babler, J. M. Butcher, Bailey Wilkinson and Charles L. Shaw, all of St. Louis, Mo., and C. A. Glueck, Belleville, Ill.

The Heine Safety Boiler Co., St. Louis, Mo., has awarded the contract to Fruen & Conlan, St. Louis, for building its new plant. The plant will include a main building, 140 ft. x 400 ft.; flange shop, 60 ft. x 180 ft., and power house, 75 ft. x 80 ft. All the buildings will be of brick and steel construction with cinder concrete roofs and the machinery equipment will be electrically driven.

The Mechanical & Manufacturers' Club, Atlanta, Ga., has been given a charter. The organization is to be composed of engineers, mechanical, manufacturing and railroad men. The incorporators are: G. E. Watts, I. T. Rose, J. J. Disoway, Harry D. Winn, J. O. Bailey, W. H. Glenn, E. E. Eagan, W. H. Taylor, C. S. Campbell, E. A. Werner, S. R. Jacobs and George Bird, all of Atlanta.

Among the contracts and orders received by the American Blower Co., Detroit, Mich., during September were the following: Forced draft equipment, Hocking Valley Railroad, South Shops, Columbus, Ohio; roundhouse heating, Northern Pacific Railroad, Paradise, Mont.; roundhouse heating equipment, N. Y. C. & H. R. R. R., Avis, Pa.; electric light plant, G. Roene, Douglas, Alaska; ventilating apparatus, Carnegie Science Hall, Wittenberg College, Springfield, Ohio; ship ventilation and induced draft, Collingwood, Ont., Shipbuilding Co.; special gas exhauster, Lincoln, Neb., Gas & Electric Light Co.; forced draft apparatus, Garfield, Utah, Smelting Co.

The Rail Joint Co., 29 West Thirty-fourth street, New York, has, during the past 14 years, produced joints for more than 50,000 track miles, enough for a double-track railroad around the earth at the equator. This, however, includes joints for

electric as well as for steam roads. It includes, too, many types, the Continuous, the Weber and the Wolhaupter; insulated, and step or compromise joints for connecting odd sections of rail in true alinement. The Troy, N. Y., works make only about a quarter of the company's product. To save freight, and for other reasons, these bars are also made and delivered from Chicago, Pittsburgh, Pa., Harrisburg, Pa., and Buffalo, N. Y.

The S. Flory Manufacturing Co., Bangor, Pa., has received orders from Cuba for one cableway equipment complete and a special hoisting engine. The company shipped several engines for the same port last week. The company is now putting up a cableway across the Delaware river for the Smith-McCormick Co. to build the D., L. & W. bridge across the river near the Delaware Water Gap. There will be two cableways, each 1,700 ft. long, designed to carry a five-ton load each. They will be constructed with one central A-frame, making a complete span of the 1,700 ft., each resting on the central A-frame. Four engines will be employed, two on the New Jersey side and two on the Pennsylvania side, operating half the span of each cableway, thereby making really four cableways to handle the concrete and other material for the construction of the concrete bridge across the river. The engines are 50 h.p. each, double-friction drum and link motion, specially designed for cableway work.

TRADE PUBLICATIONS.

Lightning Arrester.—The Railroad Supply Co., Chicago, has issued a folder describing its style F lightning arrester for signals, telephones and telegraph.

Relays.—Circular No. 11, just issued by the Hall Signal Co., New York, illustrates and describes neutral, neutral polar, differential, interlocking and other relays.

Couplers.—The McConway & Torley Co., Pittsburgh, Pa., has just issued a neat pamphlet describing an adaptation of the Janney passenger coupler, similar to the one which is in extensive use on steam lines, to meet the requirements of electric interurban service.

Crucible Melting Furnace.—The W. S. Rockwell Co., New York, has just issued a catalogue illustrating and describing crucible melting furnaces for copper, brass, bronze, aluminum, silver, gold, nickel, iron, steel, etc. This furnace is for use with either oil or gas fuel. It was described in the *Railroad Age Gazette* of August 14, 1908.

Westinghouse Nernst Lamps.—Bulletin B., just issued by the Nernst Lamp Co., Pittsburgh, Pa., contains some valuable information on Westinghouse Nernst Multiple-Glower lamps. The bulletin also contains a number of half-tone illustrations, also a line drawing showing the distribution curve of a four-glower lamp. A number of pages are devoted to price lists of lamps made by this company.

Snow Plows.—The Russell Car & Snow Plow Co., Ridgway, Pa., has just issued a pamphlet which contains illustrations and lists of general dimensions of a number of snow plows for use on both steam and electric railroads.

The company is also distributing attractive black leather card cases. They are in good taste, convenient in size and the name of the company is stamped inside.

Steel Ribs and Lagging.—George W. Jackson, Inc., Chicago, in a catalogue of 56 pages, 7 x 10 in., describes and illustrates patented steel ribs and lagging for construction of bridge piers, retaining walls, dams, concrete foundations, concrete arches and reinforced concrete buildings of every description. About half of the publication is devoted to illustrations showing the methods of construction used in several instances.

Cement.—The October bulletin of the Universal Portland Cement Co., Chicago and Pittsburgh, Pa., illustrates and describes a number of buildings, foundations, retaining walls, streets, etc., in which Universal Portland has been used. Among these are a description of the concrete foundations for the ore dock at Two Harbors, Minn., for the Duluth & Iron Range, and photographs of the concrete retaining walls used in track elevation of the Chicago Terminal Transfer.

Air Compressors.—Catalogue No. E.E.-36 has just been issued by the Ingersoll-Rand Co., New York, on the subject of small power-driven air and gas compressors, comprising descriptions of Class EE-1, Imperial Type X1, Imperial Junior and Imperial Baby compressors. The catalogue also contains a good deal of general information as to what is being done with compressed air. The same company has also issued four small pamphlets, each of which gives detailed information, with illustrations, on the following: Compressors, pneumatic pumping systems, rock excavating machinery, and electric-air rock drills and channelers.

Coal Tipples, Conveyors, etc.—Bulletin No. 22, just issued by the Jeffrey Manufacturing Co., Columbus, Ohio, gives a large amount of valuable information about Jeffrey coal tipples and shaking screens. The bulletin contains a large number of half-tone illustrations of installations. A number of line cuts show working elevations of some of these plants. Bulletin No. 27 takes up the subject of Jeffrey coal washing plants and equipments. Folder No. 67 C. deals with Jeffrey "Century" rubber belt conveyors. Booklet No. 57 D. contains information regarding conveying machinery for use in saw mills and general wood working industries.

Safety Track Appliances.—A pamphlet describing the safety track appliances and a list of the railroad specialties handled by the W. K. Kenly Co., Chicago, is being distributed. Detailed information, photographs and drawings, are given in the descriptions of the Pioneer rail anchor, Security switch point lock, anchor bottom tie plates, Latimer switch point lock, U. S. switch stand, Rizer three-way guard rail block and malleable iron rail brace. A list of the track bolts, and railroad spikes and some tables showing the requirements for one mile of track are also given. Several pages are devoted to testimonials from Engineers, Roadmasters and Purchasing Agents demonstrating the efficiency of the Pioneer rail anchor in various services.

Fifth Annual Convention of the Northwestern Cement Products Association.

At a general meeting of the executive committee of the Northwestern Cement Products Association, called by Martin T. Roche, President, at the Nicollet Hotel, Minneapolis, Minn., it was unanimously decided to hold the fifth annual convention on March 2, 3 and 4, 1909, the place to be fixed later by a committee composed of J. C. Van Doorn, C. A. P. Turner, O. U. Miracle, R. O. Miracle and Harvey B. Smith. The association has decided to present to the Minnesota State Fair a concrete building to be used solely for cement products exhibits. The following committee was appointed to select a site on the fair grounds for the structure: H. A. Rogers, E. Cobb, J. C. Van Doorn and D. L. Bell. A committee to draw plans was also appointed, consisting of the following: C. A. P. Turner, O. U. Miracle and L. V. Thayer.

Texas Equipment Orders Modified.

The Railroad Commission of Texas on October 9, made a number of orders modifying and suspending former orders to railroads requiring the purchase of new equipment in 1908.

The order to the Livingston & Southeastern is suspended entirely.

The Houston & Texas Central secured a modification and will buy two locomotives, eight passenger coaches and 38 oil tank cars.

The Orange & Northwestern is relieved of buying any equipment in 1908, and is ordered to buy two locomotives, two passenger coaches and 100 freight cars in 1909, and one locomotive, two passenger coaches and 80 freight cars in 1910.

The Texas Midland negotiated a modification and is ordered to buy 100 box cars in 1908, 100 in 1909 and 20 in 1910.

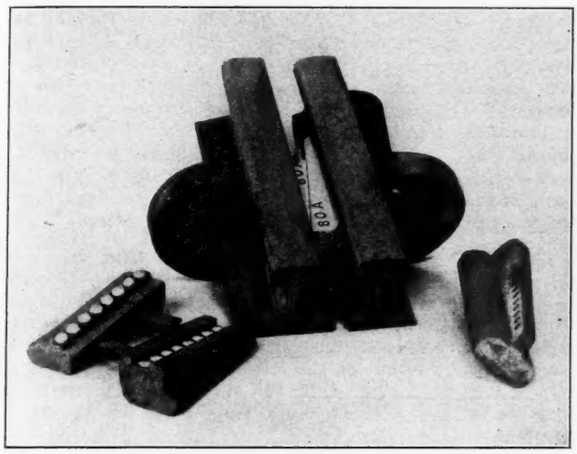
The Eastern Texas also secured a modification and is ordered to purchase two locomotives, two passenger coaches and 50 freight cars in 1908, one locomotive, one passenger coach and 50 freight cars in 1909 and 20 freight cars in 1910.

The Beaumont, Sour Lake & Western obtained a suspension

and is ordered to acquire six locomotives, four passenger coaches and 250 freight cars in 1909; four locomotives, four passenger coaches and 250 freight cars in 1910.

Adjustable Guard Rail Clamp.

The accompanying illustration shows an improved forged adjustable guard rail clamp, manufactured by William Wharton, Jr., & Co., Philadelphia, Pa. The yoke of this clamp is made of double refined iron, 3 in. to 3½ in. x 2 in., according to the rail section. The end of the bar forming the yoke is so shaped as to have bearing on the under side of



Wharton Guard Rail Clamp.

the head of the rail and also on the base, as well as the web. This is particularly important as it holds the rail firmly against tilting under the heavy side pressure to which guard rails are subjected. The filler block between the rails is made in tapered halves, with tongue and groove, which prevents vertical motion, and with button sets on the tongue and recesses in the groove which, by meshing together, prevent longitudinal movement. As the grinding of the wheels wears the side of the guard rail head, the rails have to be moved to maintain the proper width of flangeway. This adjustment is made by changing the position of the wedge of the filler block. The rails are then locked by the outside tapered wedge. This wedge is made of forged steel, with a series of cotter pin holes. Cotter pins prevent slipping of the wedge, while depending lugs prevent the blocks from creeping beyond the clamping yoke.

With the heavy traffic of the present day, the method of fastening the guard rails by brace blocks spiked to the tie is said not to be entirely satisfactory. This is particularly so when the ties are not perfectly sound, in which case constant care is necessary to keep the guard rails spiked for the proper flangeway opening. This re-spiking adds considerably to the cost of maintenance. Two of these clamps installed on each guard rail, it is claimed, hold the rail in its proper place and require little or no attention. The life of the tie ought necessarily to be prolonged, as constant re-spiking not only cuts the fiber but also leaves holes which allows water to flow into the wood and rot it. These clamps are at present in service on a number of the largest railroads in the country.

Bettendorf Steel Car Plant.

A partial view of the shops of the Bettendorf Axle Co., Davenport, Iowa, maker of all-steel cars and car equipment, is shown herewith. The site is at Bettendorf, a suburb of Davenport, and covers an area of 70 acres.

The main shop, which is 700 ft. x 240 ft., has a most complete hydraulic shop plant for shaping car parts, punching, shearing, etc., there being upwards of 60 hydraulic presses varying from 50 to 1,800 tons in capacity. In the largest of these presses 24-in. I-beams are shaped cold; that is, the ends are reduced and the beam is otherwise shaped and punched in various places without being heated. All the smaller car parts, except the castings, are shaped and prepared for use in the same way. All special hydraulic machinery used in this plant was designed and built by the company.

In conjunction with the hydraulic plant the shop contains a full complement of other machinery worked by electric power or compressed air. There are 11 electric traveling cranes of varying capacity to enable the rapid assembling of car parts. They are mostly from the Pawling & Harnischfeger Co., Milwaukee, Wis., and the Cleveland Crane Co., Cleveland, Ohio.

Much of the riveting, particularly of sheets, is done by compressed air, and this power is used in finishing most of the cast parts. A sand-blasting apparatus for cleaning the sheets and other parts of the car, preparatory to painting, is used. Electricity for light and power is furnished by the company's own plant.

Material passes through the main shop from east to west. The hydraulic presses are at the east end, where the bolster and car parts are shaped and punched. The car and bolster riveting departments are at the west end. The castings are brought from the storehouse, south of the main shop, into the center of the shop, where they are riveted to the steel bolster and car parts. The body and truck bolsters, steel underframes and all-steel cars are assembled, painted and shipped from the west end.

The power house, which is 80 ft. x 220 ft., is just south

Part of Bettendorf Plant, Chicago; Office Building on Left.

of the main building. A part of the power house was, until recently, used as the machine shop. There are six horizontal boilers, with an aggregate capacity of about 1,000 h.p., in the west end of the building, and the engine room adjoining contains the necessary pumps and other machinery.

Farther south and east are large store houses for material, covering a large area, and to the west are the paint shop and other minor buildings in a group by themselves. The Davenport, Rock Island & Northwestern, which is owned by the C., M. & St. P. and the Burlington, runs through the tract, and there are good switching and yard track facilities, including four tracks through the main buildings. Locomotive cranes facilitate the loading and unloading of material in the yards and shops.

The machine shop, as stated above, was until recently in the power building. Last fall a new machine shop was built

east of the power house and south of the main shop. The new building is 50 ft. x 380 ft. The westerly 80 ft. is for the blacksmith shop, leaving the machine shop 50 ft. x 300 ft. The office building also has recently been enlarged by adding a second story.

The Bettendorf company started about ten years ago to make I-beam bolsters in the old Davenport plant. It has since added the manufacture of the Bettendorf steel underframe, cast steel truck with integral journal boxes, and, lately, complete tank and freight cars. The plant can turn out 25 complete cars or 40 steel underframes a day. Further improvements are contemplated to add largely to this capacity.

Corrugated Re-enforcing Bars.

Corrugated round and square bars are recent types of mechanical bond re-enforcements developed by the Expanded Metal & Corrugated Bar Co., Frisco building, St. Louis, Mo.

Corrugated Reinforcing Bars.

The two illustrated herewith, which are the latest shapes, are designed to give maximum bond with the concrete with but a minimum amount of material for the bond. These bars also have decided advantages in the way of quicker and better construction. The difficulties encountered in bending plain round bars, and, especially, twisted bars so as to keep all the bends in one plane, are said to be entirely overcome in these new types.

These corrugated bars are rolled from billets of open hearth or Bessemer steel to meet the various test requirements. Unless otherwise specified, bars are furnished with an elastic limit of 50,000 lbs. per sq. in. and an ultimate strength of 90,000 to 100,000 lbs. per sq. in. The bonding value is a function of the shearing strength of the concrete. The Expanded Metal & Corrugated Bar Company also furnishes complete fabricated re-enforcement as required for any structure; also bars and stirrups bent ready to place in the forms. Purchasing re-enforcing steel in this form has many advantages. The engineer or architect is assured of accurate work and the contractor is relieved of the work of bending and fabricating.

Spence Portable Electric Conveyors.

The accompanying view shows a 60-ft. Spence portable electric conveyor, loading baggage on the steamship Mauretania. The Cunard company is now using Spence conveyors on both the Mauretania and the Lusitania. A 25-ft. conveyor in the baggage room of the ship works in conjunction with several longer conveyors between the ship and the wharf.

The Spence conveyors have been described in these columns. They have steel frames, tapering from the center to the ends, and braced to give maximum strength with minimum weight. There are roller-bearing steel sheaves, on which runs a flexible steel cable carrying an endless platform or hardwood apron. This reduces the friction greatly, minimizing the power needed to operate the conveyors. The conveyors are reversible, so that boxes, sacked goods, barrels, etc., may be taken either up or down. The conveyors are also equipped with a self-registering counter, when desired. Extension conveyors are made to be connected in series and driven from the initial conveyor. These conveyors can be placed between warehouse floor joists to run flush with the floor, allowing trucking back and forth without interference.

The Northern Pacific is using Spence conveyors at Duluth, Minn., for handling general freight, as is the Great Northern Steamship Co. at Seattle, Wash. Some other users are: The Old Dominion Steamship Co., Norfolk, Va.; Federal Sugar Refining Co., Yonkers, N. Y.; Warner Sugar Refining Co., Edgewater, N. J.; Western Transit Co., Buffalo, N. Y.; Washington Stevedoring Co., Seattle, Wash. The headquarters of the Spence Manufacturing Co. are at St. Paul, Minn.

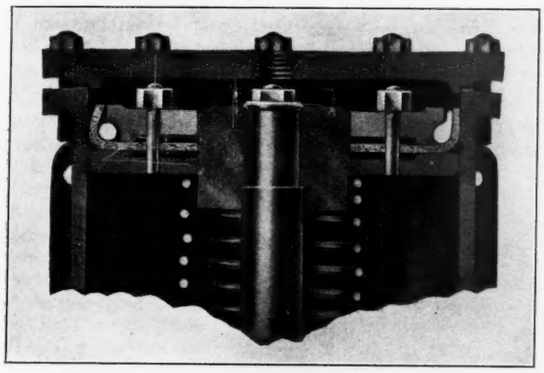
Cylinder Packing Expander Ring.

The sectional view of an air-brake cylinder shown in the accompanying half-tone illustrates two kinds of packing expander rings. The one at the left side of the cylinder is the common steel wire ring, while the one at the right is an improved form, the J-M. expander ring, made by the H. W. Johns-Manville Co., New York.

The ordinary steel wire expander ring, although in very wide use, is said to be the cause of more or less trouble and delay in the operation of air-brakes. Some trouble has been caused by a leakage of air past the packing leather as the expander ring was not entirely satisfactory. It will be noticed that the improved form of ring is of such cross section as to provide additional bearing on the packing leather. This ring is made of the best spring steel and it is claimed will outlast other parts of the brake equipment. A large surface of packing leather is held against the sides of the cylinder, which distributes the wear over a larger area than with the wire section, and at the same time prevents leakage. It is said that packing leathers which have been discarded

Spence Conveyor Loading Baggage to Steamship Mauretania.

on account of leakage can be again put in service by substituting this J-M. expander ring for the ordinary steel wire. As with the steel wire ring there is very little bearing surface against the cylinder wall, a very small defect in the packleather will permit leakage. In the case of this new form of ring, with additional bearing, there is less chance for this



Section Showing Types of Expander Rings.

defect. As mentioned above, this ring holds the packing leather flat against the cylinder wall, giving a bearing surface about ½ in. wide which is more than three times as much bearing surface as is obtained by using wire rings.

Railroad Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

W. T. Eldridge has been elected President of the Sugarland Railway, succeeding J. Lane, resigned.

A. M. Ingersoll has been elected a Vice-President of the Chicago, Milwaukee & St. Paul, of Washington, with office at Tacoma, Wash.

Walker D. Hines has been elected Chairman of the Executive Committee of the Atchison, Topeka & Santa Fe, succeeding Victor Morawetz, resigned.

Edward S. Moore, Assistant Superintendent of the Rock Island-Frisco Terminal Co. at St. Louis, Mo., has been appointed Second Assistant to the President of the Chicago, Rock Island & Pacific, with office at Chicago. After graduating from Yale University, Mr. Moore began railroad work on the Chicago, Rock Island & Pacific in the superintendent's office at Cedar Rapids, Iowa. He was later transferred to the transportation department at Chicago, and remained there for nearly a year. He was then appointed to special service connected with the President's office, and was engaged in investigating car shortages, claims, and in other work of this nature. He was later transferred to the St. Louis & San Francisco, being assigned the same kind of work. In 1905 he was appointed statistician to the President of the St. Louis & San Francisco, and on November 8, 1907, was appointed Assistant Superintendent of the Rock Island-Frisco Terminal Co. In this position he performed the duties of a joint Freight Agent of the Chicago, Rock Island & Pacific and the St. Louis & San Francisco.

Edward S. Moore

Thomas H. Gill, General Counsel of the Wisconsin Central, has resigned, effective November 1. Walter D. Carrigan, of the legal department, succeeds Mr. Gill.

F. G. Pettibone, Second Vice-President and General Manager of the Gulf, Colorado & Santa Fe, has been elected also President of the Houston Belt & Terminal Co., Houston, Tex.

M. S. Decker, of the New York Public Service Commission, Second District, has been elected President of the National Association of Railway Commissioners, succeeding C. C. McChord.

L. J. Polk, Vice-President and General Manager of the Stephensville North & South Texas, has resigned to devote his entire time to the Ravia Granite & Ballast Co. His duties are assumed by B. C. Cage, President.

Frederick Foster has been elected a member of the Board of Directors of the Chesapeake Steamship Co., succeeding R. C. Foster, deceased. Mr. Foster is a graduate of the Johns Hopkins University and of the law school of the University of Maryland, and has for the past five years been Assistant Solicitor of the Boston & Maine.

A. E. Welby, whose election as First Vice-President of the Denver, Laramie & Northwestern has been announced in these columns, was born in 1855 at Georgetown, South Africa. After being educated at the Fortora Royal School, Enniskillen, Ireland, and the Royal Naval Academy, Gosport, England, he began railroad work in 1872 as rodman on the Great Western of Canada, now part of the Grand Trunk. After a year of this work, and three years in various positions in the operating department, he went into the office of the chief engineer of the Canada Southern, now part of the Michigan Central. In August, 1877, he was made a freight clerk on the Grand Trunk, and two years later became clerk to the Superintendent. In 1881 he went to the Denver & Rio Grande as clerk to a Division Superintendent, being promoted two years later to chief clerk to the General Superintendent. In May, 1887, he was appointed chief clerk in the General Manager's office. In July, 1890, he was made Superintendent of the Rio Grande Western, and in 1892 was promoted to General Superintendent. Later in the same year he went to Lima, Peru, as General Manager of the Cerro De Pasco Railroad. In 1904 he returned to the Rio Grande Western as General Superintendent, and two years later was made General Superintendent of the Denver & Rio Grande System. In April, 1908, he was made General Superintendent of the Colorado and New Mexico lines of the Denver & Rio Grande, with office at Denver, Colo., which position he held until his recent election as First Vice-President of the Denver, Laramie & Northwestern.

A. E. Welby.

Traffic Officers.

The general passenger offices of the Boston & Albany at Boston, Mass., are to be moved, on November 1, to New York.

W. R. Pargeter has been appointed Commercial Agent of the Union Pacific at Norfolk, Neb., succeeding N. W. Clover, resigned.

The office of H. P. Radley, General Freight and Passenger Agent of the Southern Indiana, has been moved from Chicago to Terre Haute, Ind.

George W. Pettengill has been appointed General Travel-

ing Agent of the Clyde Steamship Co., with office at Pier 36, North river, New York.

J. F. Slowley has been appointed Commercial Agent of the Georgia Southern & Florida, with office at Nashville, Tenn., succeeding R. R. D. Tollowell, resigned.

J. F. Gowan, Southwestern Passenger Agent of the Chicago & Eastern Illinois, has been appointed Traveling Passenger Agent of the Missouri Pacific at Chicago.

H. P. Hughes, Traveling Passenger Agent of the Texas & Pacific, has been appointed General Baggage Agent at Dallas, Tex., succeeding W. W. Campbell, resigned.

Richard A. Belding, Traffic Manager of the Inter-Urban Railway of Des Moines, Iowa, has been appointed General Eastern Agent of the Chicago Great Western.

J. C. Reister, Commercial Agent of the San Antonio & Aransas Pass, at Houston, Tex., has been appointed Traveling Freight Agent. Arthur R. Canfield succeeds Mr. Reister.

William Kirlicks has been appointed Commercial Agent of the Houston & Texas Central at Corsicana, Tex. Nathaniel Parks has been appointed Live Stock Agent at San Antonio, Tex.

H. C. Young, Traveling Passenger Agent of the Chicago, Rock Island & Pacific at Pittsburgh, Pa., has been appointed Traveling Passenger Agent of the Missouri Pacific at Pittsburgh.

R. W. Weaver has been appointed Manager of a joint freight filing bureau at Montgomery, Ala., for the Seaboard Air Line, the Mobile & Ohio, the Atlantic Coast Line and the Central of Georgia.

Ashton B. Collins has been appointed Soliciting Freight Agent of the New Orleans & Northeastern, Alabama & Vicksburg, and Vicksburg, Shreveport & Pacific, succeeding W. F. Rodgers, transferred.

E. J. Dowie has been appointed Industrial Agent of the Cleveland, Cincinnati, Chicago & St. Louis and the Cincinnati Northern, with office at Cleveland, Ohio, reporting to the General Freight Agent at Cincinnati, Ohio.

J. C. Finch has been appointed Assistant General Freight Agent of the Missouri, Kansas & Texas at Kansas City, Mo., succeeding R. F. Campbell. L. B. Chipley has been appointed Commercial Agent at Oklahoma City, Okla.

E. J. Richards, Chief Assistant General Passenger Agent of the New York Central & Hudson River, has resigned on account of ill health, and will hereafter perform such duties as may be assigned to him by the General Passenger Agent.

P. B. Maxwell, Traveling Passenger Agent of the New York Central & Hudson River at Buffalo, N. Y., has been transferred, as Traveling Passenger Agent, to Watertown, N. Y. C. F. McDonald, Passenger Agent at Niagara Falls, succeeds Mr. Maxwell.

D. W. Head, Traveling Freight Agent of the Gulf, Colorado & Santa Fe at Ft. Worth, Tex., has been appointed Soliciting Freight Agent, with headquarters at Houston, Tex., succeeding J. Carlton, transferred to Sealy, Tex. A. G. Graham, Soliciting Freight Agent at Ft. Worth, succeeds Mr. Head. W. L. McWhirter succeeds Mr. Graham.

Operating Officers.

J. W. Ryan has been appointed Superintendent of the Salt Lake & Ogden, succeeding A. D. Pierson.

D. Dale, Assistant Trainmaster of the Vandalia at Terre Haute, Ind., has been transferred to Logansport, Ind. L. E. Bailie succeeds Mr. Dale at Terre Haute.

E. G. Goforth has been appointed Chief Train Despatcher of the Fort Worth division of the International & Great Northern, with office at Mart, Tex., succeeding A. G. Whittington.

G. C. Foy has been appointed Chief Train Despatcher of the Grand Rapids-Iona division of the Pere Marquette at Detroit, Mich., effective October 1, succeeding G. W. Groom, resigned.

F. Cone has been appointed Trainmaster of the Ottumwa division of the Chicago, Burlington & Quincy, with office at Burlington, Iowa, succeeding W. H. DeWitt, resigned to go to another company.

H. Knowles, whose resignation as Car Accountant of the Illinois Southern was announced in our issue of October 9, remains Car Accountant of the Southern Indiana and Chicago Southern.

J. F. Liston has been appointed Chief Despatcher and Division Operator of the Birmingham district of the St. Louis & San Francisco, with office at Birmingham, Ala., succeeding W. H. Walsh, assigned to other duties.

F. P. Gutelius, whose appointment as General Superintendent of the Canadian Pacific we have announced, was born at Mifflinburg, Pa., December 21, 1864. He was educated at Lafayette College, Easton, Pa., and graduated with the degree of Civil Engineer in 1887. For about four years he worked on the Pennsylvania Lines West in various subordinate engineering positions, and for three years after that was engaged in hydraulic and general engineering work at Butte, Mont. In November, 1895, he took charge of the construction and operation of the Columbia & Western, and when, in 1898, this road was taken over by the Canadian Pacific, he became Superintendent, and later Resident Engineer and Engineer of Maintenance of Way. For the past two years he has been Assistant Chief Engineer, which position he held until his recent appointment.

F. P. Gutelius.

Engineering and Rolling Stock Officers.

C. W. Tessiers has been appointed Master Car Builder of the Mexican Central, succeeding J. H. O'Brien, resigned.

T. S. Leake, Superintendent of Buildings of the Missouri Pacific, has resigned to engage in general contracting business.

J. M. McGreery has been appointed Roadmaster of the Canadian Pacific at Nelson, B. C., succeeding H. Beck, assigned to other duties.

E. M. Sweetman has been appointed Master Mechanic of the Southern Railway at Sheffield, Ala., succeeding W. F. Moran, resigned.

J. F. Casey has been appointed General Foreman, Car Department, of the St. Louis, Brownsville & Mexico, with headquarters at Kingsville, Tex.

G. W. Cuyler, Roundhouse Foreman of the Cleveland, Cincinnati, Chicago & St. Louis at Mt. Carmel, Ill., has been appointed Roundhouse Foreman of the Chicago, Rock Island & Pacific at Booneville, Ark., succeeding A. Schnable, resigned.

J. T. Carroll, Assistant Master Mechanic of the Lake Shore & Michigan Southern at Elkhart, Ind., has been appointed Master Mechanic of the Lake Erie & Western at Tipton, Ky. A. R. Ayres, Assistant Superintendent of Shops at Collinwood, Ohio, succeeds Mr. Carroll.

T. M. Baughan, formerly connected with the Illinois Central at Paducah, Ky., has been appointed General Car Foreman of the Arkansas division of the Chicago, Rock Island & Pacific, succeeding T. E. Carter, resigned to become General Car Foreman of the Denver & Rio Grande at Denver, Colo.

S. E. Kildoyle, whose resignation as Master Mechanic of the Chihuahua division of the Mexican Central has been announced in these columns, has been appointed Master Me-

chanic and Master Car Builder of the Vera Cruz & Isthmus, with headquarters at Sierra Blanco, V. C., Mex. He has charge of all shops, equipment and motive power.

OBITUARY.

Isaiah S. P. Weeks, for 21 years Chief Engineer of the Chicago, Burlington & Quincy lines west of the Missouri river, died at his home in Lincoln, Neb., August 31, after an illness lasting over a year. He was afflicted with "Addison's" disease, and, although an operation was performed by eminent specialists, there was a gradual decline until the end.

I. S. P. Weeks.

Mr. Weeks was born at Nantucket, Mass., May 8, 1847, and inherited the energetic and upright nature which was so characteristic of the old settlers of the coast towns of New England. His early education was obtained at the district school at Barnstable, and his professional training at the Massachusetts Institute of Technology, where he graduated as civil engineer in the class of 1871. During the summer vacation of 1870 he did his first engineering work on the Burlington, and after graduation obtained a regular position with the engineering corps of the same road on the lines west of the Missouri river, and remained there until the road was extended as far as Kearney, Neb., in 1873. During the next six years he was employed in the office of Col. Thomas Doane, Charlestown, Mass. In 1879 he went to the Northern Pacific and was in charge of the construction of the Missoula division. In 1885 he returned to the Burlington as assistant to the Chief Engineer of the Western lines; and in the following year was made Chief Engineer of that grand division of the system. When Mr. Weeks took active charge of construction in 1885, the mileage west of the Missouri river was about 1,500 miles, and at the time his health failed and he was compelled to retire, the mileage was 4,500—3,000 miles having been built under his direct supervision. Much of this work was done under exceedingly high pressure, as 1,075 miles of new track were built in the years 1886 and 1887 alone.

While much of the mileage in Nebraska is comparatively level and of easy alinement, the extensions into the western part of South Dakota, Wyoming and Montana pass through a rugged, mountainous country where the highest engineering skill was required for an economic location. Mr. Weeks' splendid work in the construction of the line through the Spearfish canyon is particularly creditable, and this part of the line is only to be compared, in the difficulties of location, with the most picturesque portion of the Denver & Rio Grande. Mr. Weeks thus leaves an impressive monument in the long reaches of substantial railroad track which he laid out from the close network in Nebraska to the mountainous region of Wyoming and Montana.

Mr. Weeks had a commanding figure, a handsome face and a pleasant, kindly expression. Always modest and polite, his cheery salutation made him a favorite and friend among all his acquaintances, and especially with those employed in his department.

Mr. Weeks was married to his Barnstable schoolmate, Miss Sarah Curtis Thayer, on December 30, 1873. His wife and all his children survive him. The children are Otis, Civil Engineer employed in Canada; Emily, wife of Dr. T. P. Sedgewick, Minneapolis, and Paul, Mechanical Engineer with the Baldwin Locomotive Works, Philadelphia.

Railroad Construction.

New Incorporations, Surveys, Etc.

ATLANTA, BIRMINGHAM & ATLANTIC.—The Birmingham division has been extended from Talladega, Ala., west to Birmingham, 68.6 miles. (Sept. 4, p. 888.)

ATLANTA NORTHEASTERN.—The Railroad Commission of Georgia has authorized this company to issue $1,200,000 in stock and bonds for building the proposed line from Atlanta, Ga., northeast to Cummings, about 42 miles. It is intended to extend the line from Cummings north to Dahlonega, in Lumpkin county, and also from Cummings to Ellijay, in Gilmer county. The following are interested: F. C. Tate, Jasper, Ga.; C. C. Foster and J. O. Crowley, of Rosswell; W. R. Atwell and C. I. Harris, of Cummings.

ATLANTIC, NORTHERN & SOUTHERN.—This company, operating a 17-mile railroad from Kimballton, Iowa, south to Atlantic, is planning to build an extension south to Villasca, 38 miles. The question of building north from Kimballton either to Manilla, 20 miles, or to Carroll, 30 miles, is under consideration.

CANADIAN NORTHERN.—The Brandon-Regina line, which has been completed and officially inspected, is awaiting the approval of the Board of Railway Commissioners prior to operation.

CANANEA, YAQUI RIVER & PACIFIC.—This company has opened a new branch for business from Lomas Junction, Sonora, Mex., east to Zorilla, 39 miles.

CAROLINA, CLINCHFIELD & OHIO.—The McArthur Bros. Co., which has the contract for the line from Bostic, N. C., to Spartanburg, S. C., 32 miles, has given sub-contracts for 18 miles, as follows: Bostic to Second Broad River, five miles, J. Nichols, Parkesburg, W. Va.; Second Broad River to Floyd Creek, five miles, Purcell, Allen, Shehan & Co., Washington, D. C.; Broad River to Little Buck Creek, Williams, Lewis & Spradlin, Atlanta, Ga.; Pacolet River to Peters, three miles, to Reagan & Yale. Most of the heavy masonry work has been let to J. C. Dunn, Cleveland, Ohio, and Thomas Shehan, Nashville, Tenn. The trestle work has been awarded to H. J. Collier & Co., Cleveland, Ohio.

An officer writes regarding the projected extension on the northern end of the road from Dante, Va., north to Elkhorn, Ky., where connection is to be made with the Chesapeake & Ohio, that it has not yet been definitely determined which one of several routes under consideration will be adopted.

On the southern end of this road, passenger service has been extended from Altapass, N. C., south to Marion, 31.6 miles.

CHICAGO & ALTON.—The annual report of this company for the year ended June 30, 1908, says that for many reasons improvements during the past year were not so extensive as those made in any year since 1900. The air line between Iles, Ill., and Murrayville was completed and put in operation on September 28, 1907. Grade reduction on the Springfield-Peoria branch has been completed so that northbound trains operate on about a 0.3 per cent. grade. This is the same grade that now prevails on the air line and from Bloomington to Chicago, and which it is intended shall ultimately prevail from Roundhouse and the coal fields in Sangamon and Macoupin counties, Ill., to Chicago. The heaviest Alton freight engines regularly haul a net train load of 3,400 tons on this grade. Extensive repairs and additions were made to freight facilities at East St. Louis. Some of the improvements contemplated for the ensuing year, besides track elevation, include extension and reconstruction of terminal freight house and yards and the construction of an office building in Chicago; building of both new freight and new passenger stations on new sites at Jacksonville, Ill., and a re-arrangement of local yards there; and strengthening of the roadbed across the Missouri valley.

CHICAGO & MILWAUKEE (ELECTRIC).—One of the receivers is quoted as having said that the line from Evanston, Ill., north to Milwaukee, Wis., will be opened this week. Cars are now being operated regularly on this line from Evanston to Racine, Wis. (Aug. 21, p. 787.)

Chicago, Milwaukee & St. Paul.—Newspaper reports say that engineers of the Port Angeles Railway & Terminal Co. are surveying eastward from Port Angeles, Wash., toward Port Ludlow, about 45 miles. The preliminary surveys are said to be about half finished and it is expected that the location surveys will be under way about the middle of this month. (R. R. G., May 15, p. 687.)

Chicago, Ottawa & Peoria.—An officer writes that this company operates the Illinois Valley Railway from Princeton, Ill., east to Seneca, 58.36 miles of interurban electric line. Work is now under way on a 16-mile branch from Streator north to a connection with the main line at Ottawa. W. B. McKinley, President, Champaign, Ill. (Oct. 2, p. 1,075.)

Denver, Laramie & Northwestern.—Construction work, it is said, is being pushed on this line north from Denver, Colo. The company was organized to build from Denver, north via Fort Collins, Colo., and Granger, Wyo., to Seattle, Wash., 1,400 miles. Ties for 70 miles have been bought and 225 carloads of ties have been delivered. Grading for 70 miles on the most expensive and heaviest section of the line, including a 700-ft. trestle at Sand Creek (Denver) has been finished. Grading contract was let last May to Frederick B. Orman & Co. for the first section from Denver to Fort Collins. (Aug. 7, p. 693.)

Denver, Northwestern & Pacific.—An officer writes that this company has now finished its road from Denver, Colo., west for 195 miles, and is laying track on 19 miles additional to reach Steamboat Springs. Contract was let for the section from Yarmony west to Steamboat Springs, 68 miles, and this section is to be finished November 1. From Steamboat Springs west the work will be easy, running through valleys nearly all the way to Wolesatch range, about 300 miles. The line is eventually to be extended west to Salt Lake City, Utah. There is now in operation 185 miles from Denver west to Yampa. There have been built, so far, 800 lin. ft. of steel bridges, and 55 tunnels aggregating 23,973 ft. in length. (Oct. 9, p. 1,120.)

El Reno, Red River & Pacific.—See Fort Smith & Western.

Erie.—The first train was run over the Erie & Jersey (Guymard cut-off of the Erie) on Thursday, October 15. The Erie & Jersey runs from Newburg Junction, N. Y., to Guymard, 42 miles.

Fort Smith & Western.—Press despatches from Oklahoma City say that at a meeting of the officials of this road with those of the El Reno, Red River & Pacific it was decided to begin construction on the latter company's proposed 150-mile line within the next 30 days. (June 19, p. 208.)

Georgia & Florida.—On the Hazelhurst-Douglas-Valdosta division, formerly known as the Douglas, Augusta & Gulf division, a connecting link from Nashville, Ga., south to Valdosta, Ga., 30 miles, has been opened for business. The Valdosta-Madison division, formerly known as the Valdosta-Southern division, now has a track connection with the Seaboard Air Line at Madison, Fla. (Aug. 28, p. 839.)

Georgia, Southwestern & Gulf.—Contracts, it is said, will be let by this company during November or December for building part of its proposed line. The projected route is from Albany, Ga., southwest via Colquitt and Donaldsonville, Ga., and Marianna, Fla., to St. Andrews bay on the Gulf of Mexico, about 160 miles. The necessary capital to finance the project is said to have been secured. W. M. Legg, President, Macon, Ga.; T. H. Hazelrigg, Chief Engineer, 126 East Market street, Indianapolis, Ind.

Great Northern.—The Vancouver, Victoria & Eastern has made application to the Railroad Commissioners of Canada for authority to build a branch line from False Creek, B. C., to Burrard inlet. A somewhat similar route between these points had previously been located by the Vancouver, Westminster & Yukon, which company was recently granted a subsidy of $200,000 towards building a bridge across Burrard inlet, the estimated cost of which is given as $1,250,000.

According to reports from Spokane, Wash., this company has completed plans to extend its Waterville line from Wenatchee, Wash., southeast to Pasco, about 150 miles. The new line will cross the Butte extension of the Chicago, Milwaukee & St. Paul at Beverly, Wash.

Idaho Northern.—The completed line of this company will be turned over to the operating department about the middle of January, 1909. The line is being built from Enaville, Idaho, to a point east of Murray to furnish transportation facilities to the mining country in the Murray district of the Coeur d'Alene. E. P. Spaulding, Vice-President and General Manager of the company, who is directing the construction of the new line, made the following statement in Spokane:

"The first six miles of road, including the stations at Enaville, Little North Fork and Haights, have been opened for handling freight on work trains. Stations at Smith's Spur and Steamboat Creek will be opened in a few weeks; Nelson siding, November 1; Beaver, November 15; Pritchard and Eagle, December 1. Murray will be reached and operation started by December 15, and Raven, Monarch and Paragon by the first of the year. The grade between Enaville and the mouth of Pritchard creek will be finished within 30 days. Grading beyond Pritchard Creek is about half done and will be completed early in November. Track on four miles has been laid and the work is progressing at a rate of from a half to three-quarters of a mile a day. Work is being done on both of the bridges across the north fork of the Coeur d'Alene river, each to be 150 ft. long. One is 16 miles above Enaville and the other about 19 miles. The officers of the company are: B. F. O'Neill, of Wallace, Idaho, President; E. P. Spaulding, of Spokane, Vice-President and General Manager, and E. L. Proebsting, of Wallace, Secretary and Treasurer. W. P. Smith is Chief Engineer. (Aug. 14, p. 741.)

International of New Brunswick.—The Dominion Government has granted a subsidy contract to this company for building a line from Campbellton, N. B., to St. Leonards, on the St. John river, about 90 miles. It is intended to complete the grading on the extension this fall. The work is being carried on from both ends, a considerable portion of the track having been laid. T. Malcolm, of Campbellton, contractor. (June 26, p. 409.)

Kansas City, Mexico & Orient.—This company has extended its service from Elmer, Okla., south to Chillicothe, Tex., 20 miles; also from Truscott, Tex., north to Crowell, 18 miles. Between Crowell and Chillicothe there remains a gap of 23 miles yet to be placed in operation to complete the line from Sweetwater, Tex., north to Wichita, Kan. (Oct. 9, p. 1,121.)

Lawton, Wichita Falls & Northwestern.—An officer writes that this company is building a line from Red River Junction, Okla., where connection is to be made with the Wichita Falls & Northwestern, north via Randlett and Emerson to Lawton, Okla., 40 miles, passing through the large reservation opened by the government last year. Grading has been finished on eight miles and ties and rails are being received for this section. There are to be two steel bridges and about 300 ft. of trestle work. Grading contract from Randlett to Emerson, 16 miles, let to the Joe Kirks Construction Co., Oklahoma City. J. M. Bellamy, President, Lawton; Charles Orth, Chief Engineer, Randlett, Okla.

Matane & Gaspe.—Plans for the bridge across the Metis river on the line from St. Flavia, Que., to Matane, have been completed. It is expected that the line will be in operation in the fall of 1910. (Oct. 9, p. 1,121.)

Mexican Roads.—A new railroad is projected to pass through parts of the states of Coahuila, Mex., and Chihuahua, in territory which is at present without railroad facilities. The eastern terminus of the road is to be at Monclova, Coahuila, on the line of the Mexican International. It is to be extended in a northwesterly direction to Chihuahua, the capital of the state of the same name. The new line will be about 375 miles long. Engineers expect to start soon on the preliminary reconnoissance. If the engineers report that a low grade route is practicable, there is but little doubt but that the road will be built, as the promoters are said to have ample capital and are interested in the resources of the region through which the road will pass. It is also expected that government subsidies will be forthcoming in case the report of the engineers is favorable.

MIDWAY & VERNON.—The Dominion Government has granted a subsidy contract for building a line from Midway, B. C., north to Vernon, about 85 miles.

MILWAUKEE LIGHT, HEAT & TRACTION.—This company has been authorized to build a branch line from Waterford, Wis., the present terminus of the Milwaukee-Southwestern division, southwest to Lake Geneva. (Aug. 21, p. 788.)

MILWAUKEE NORTHERN.—President Comstock is quoted as having announced that arrangements have been made with the Chicago & Milwaukee Electric for exchange of transfers. The line has just been completed from Milwaukee, Wis., north to Sheboygan. (Oct. 2, p. 1,075.)

MISSOURI, ARKANSAS & SOUTHWESTERN.—According to press despatches, this company has made surveys for its proposed line from Batesville, Ark., northeast to Black Rock, 40 miles. The line is eventually to reach Hoxie and Imboden. Right of way is being secured. R. W. Earnheart, President, Batesville; I. J. Matheny, Secretary. (Sept. 3, p. 889.)

MONTANA ROADS (ELECTRIC).—A company, it is said, is being organized to build a 25-mile electric line from Conrad west. W. W. Withee and W. S. Cargill, who recently bought the Conrad lands north of Great Falls, Mont., are the principal promoters.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—See Western & Atlantic.

NEBRASKA TRACTION & POWER CO.—Incorporated in Nebraska with $2,000,000 capital to build a line from South Omaha, Neb., south into Sarpy county, and also from South Omaha north through Douglas, Dodge, Washington, Burt, Cuming, Thurston and Dakota counties, in all about 100 miles. It has not yet been decided whether the company will use steam or electricity for its motive power. A grading contract, it is said, has already been let and other contracts for material will be let soon. The incorporators include: N. Uhl, N. B. Dodge, W. D. Dodge, W. D. Crist, W. A. Howard and J. F. Emmett, all of Omaha. W. D. Crist is connected with the General Construction Co., which is to build this line.

NEW YORK, NEW HAVEN & HARTFORD.—The decision of the Court of Appeals which holds that the New York, Westchester & Boston, controlled by the New Haven, must obtain a certificate of public necessity from the New York Public Service Commission before proceeding with condemnation proceedings against the Huntington estate for right of way is thought to establish the validity of the New York, Westchester & Boston charter.

NEW YORK, WESTCHESTER & BOSTON.—See New York, New Haven & Hartford.

NEZPERCE & IDAHO (ELECTRIC).—Contracts, it is said, have been given by this company for rails to be used on the first 14 miles of the line it is building from Nezperce, Idaho, northeast to a connection with the Grainville branch of the Northern Pacific. Track laying is to be begun as soon as the rails are delivered. All the grading and the bridges, it is expected, will be finished in October. W. P. Wood, of Nezperce, is engineer in charge. (Sept. 19, p. 981.)

NEW ORLEANS GREAT NORTHERN.—President C. W. Goodyear is quoted as saying that work is to be resumed at once on both the Mandeville and the Tylertown branches, as well as on the main line. It is expected that the Mandeville branch will be finished and put in operation by November 15, and the Tylertown branch by December 25. (Oct. 4, p. 403.)

NEW ORLEANS, NATALBANY & NATCHEZ.—This road has been extended from Montpelier, La., north four miles to Pinegrove.

OMAHA, LINCOLN & BEATRICE (ELECTRIC).—See Omaha, Lincoln & Southwestern.

OMAHA, LINCOLN & SOUTHWESTERN.—Incorporated in Nebraska with $100,000 capital to build from Omaha, Neb., southwest to Lincoln, about 60 miles. The incorporators include D. D. Sholes and C. L. Dundey, of Omaha. It is said the line is to be a competitor of the Omaha, Lincoln & Beatrice, building an electric line between these two places, part of which is now in operation.

PORT ANGELES RAILWAY & TERMINAL.—See Chicago, Milwaukee & St. Paul.

PRINCE EDWARD ISLAND.—The Dominion Government is interested in having a line built from Murray river north to Montague, via Murray Harbor North.

QUEBEC CENTRAL.—An officer writes that location surveys are being made for an extension of the Chaudiere Valley branch from St. George, Beauce, Que., to Ste. Justine, Dorchester county, 30 miles. This is to be the first section of a branch to be built towards the Temiscouata Railway, which is 140 miles from St. George. Bids for the first section have been asked, and it is expected that the 30 miles will be built and put in operation by the end of 1909. The route follows the valley of the Famine river its entire distance from St. George to Ste. Justine and is favorable for railroad construction. Maximum grade will be 0.6 of 1 per cent., and maximum curvature, 5 degrees.

SANOODY VALLEY RAILROAD.—J. P. Hornaday & Co., New York, who are interested in the building of this line, are receiving bids for grading 12 miles. (Oct. 2, p. 1,075.)

SIOUX CITY & SPIRIT LAKE (ELECTRIC).—An officer writes that a contract has been given to Westinghouse, Church, Kerr & Co. to build this proposed line. The projected route is from Sioux City, Iowa, northeast to Spirit Lake. Maximum grade is to be about 1 per cent., with 3 deg. curvature outside of the towns. Grading will necessitate handling about 17,000 cu. ft. of earth to the mile. The track is to be laid with 70-lb. rails. Frank Patch, President; G. Coleman, Secretary; J. D. Browning, General Manager, and L. F. Wakefield, Chief Engineer, Sioux City. (Sept. 4, p. 889.)

SOUTHERN.—On the Birmingham branch, the line formerly operated between Ensley Junction, Ala., and Cymbling Branch Junction has been extended from the latter place five miles to Maxine.

SPARTA-MELROSE ELECTRIC RAILWAY & POWER CO.—See Wisconsin Roads.

VIRGINIAN RAILWAY.—The section of this road from Victoria, Va., west to Altavista, 81 miles, was recently placed in operation. The eastern part of the road is now in operation from Norfolk, Va., west to Altavista, 200.6 miles; and the western part is in operation from Matoaka, W. Va., north to Deepwater, 79.5 miles, leaving a gap of 161 miles between Altavista and Matoaka, on which work is now under way. When finished, the line from Norfolk to Deepwater will be 441 miles long. (R. R. G., March 13, p. 395.)

WESTERN & ATLANTIC.—A commission appointed by the state of Georgia is to investigate the practicability of extending this road from Atlanta to the sea. The road is owned by the state and operated by the Nashville, Chattanooga & St. Louis.

WICHITA FALLS & NORTHWESTERN.—Press reports from Austin, Tex., say that the Wichita Falls & Southwestern is to be extended from New Castle, Young county, Tex., south to Llano, about 250 miles from Wichita Falls. The Wichita Falls & Northwestern, which is now in operation from Wichita Falls, Tex., north to Frederick, Okla., where it connects with the St. Louis & San Francisco, is to be extended northwest to Altus, Okla., about 26 miles, to a connection with the Kansas City, Mexico & Orient. (June 19, p. 209.)

WICHITA FALLS & SOUTHERN.—See Wichita Falls & Northwestern.

WISCONSIN ROADS.—A company is being organized by the Western Transportation Co., St. Paul, Minn., to build a line to be operated both by steam and by gasolene motor cars from Portage, Wis., north, via Briggsville, Oxford and Friendship to Grand Rapids, about 70 miles. Contracts for building the line are to be let as soon as incorporation is completed. The company proposes to take over the property and all the rights of the Sparta-Melrose Electric Railway & Power Co. of Wisconsin (July 24, p. 601), which was organized with headquarters at Melrose, to build an interurban traction line from Sparta, northwest via Angelo, Trout Fall and Cataract, to Melrose, 28 miles, on which construction work is to be started by the spring of 1909. The Western

Transportation Co. will also incorporate a company to build a line from Galesville, Wis., to Ettrick, on which work, it is expected, will be begun soon. J. N. Braun, St. Paul, Minn., is to be President, and Clayton Oehler, Chief Engineer.

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Alberta Railway & Irrigation Co.—See Canadian Pacific.

Apalachicola Northern.—This company, which has been in the hands of a receiver since September, 1907, is now being operated by the company, the receiver having been discharged. The road runs from River Junction, Fla., to Apalachicola, 80 miles.

Boston & Maine.—The stockholders voted on October 14 to increase to 16 the number of directors, the present number being 11. The following additions to the present board have been made: Edward B. Ricker, of South Poland, Me.; Fred E. Richards, of Portland; James M. Prendergast, of Boston, Mass.; Edwin F. Greene, of Wayland, Mass.; Frederick C. Dumaine, of Concord, Mass.; Frank T. Brown, of Norwich, Conn.; Charles F. Lindsley, of Meriden, Conn.; Samuel Hemingway, of New Haven, Conn.; John L. Billard, of Meriden, Conn. The directors resigned are: Walter Hunnewell, Henry F. Dimock, Alexander Cochrane, T. P. Beal. The stockholders also rescinded the vote of October, 1907, authorizing $6,000,000 bonds and voted to issue not over $12,000,000 bonds for refunding and other purposes.

Canadian Pacific.—Stockholders have voted to ratify the purchase of a controlling interest in the Alberta Railway & Irrigation Co., at a cost of $2,000,000. The Alberta Railway & Irrigation Co. operates a line running from Lethbridge, Alb., to Sweet Grass, 66 miles.

Central of Georgia.—Judge R. G. Lovett, General Counsel of the Union Pacific, has been elected a Director of the Central of Georgia, succeeding Stuart R. Knott.

Chicago & Alton.—Equipment notes to the amount of $2,000,000 have been issued to pay for 2,000 steel freight cars recently ordered. The Standard Steel Car Co., who will build the cars, will receive the notes and sell them.

Gulf & Ship Island.—No dividend for the current quarter has as yet been declared on the common stock. The last quarterly dividend was paid in July and was at the rate of 4 per cent. per year.

Hocking Valley.—D. Milbank has been elected a director, succeeding H. R. Wilson, resigned.

Hudson Companies.—This holding company for the Hudson river tubes announces a new financial plan for the completion of the unfinished parts of the tunnel system between New York and New Jersey. The Hudson Companies are to pay the Hudson & Manhattan Railroad, which is the operating and construction company, $7,379,681 needed to complete the tunnels. This money is to be raised by an issue of $5,000,000 three year 6 per cent. notes, and by the sale of the Thirty-third street terminal property for about $3,000,000. The president of the Hudson Companies says in part: "In lieu of the further performance of the obligations of this company under its original construction contracts and its other undertakings with the railroad company, the railroad company will accept payment of $7,379,681, to be used by it to complete the construction and equipment of the 'Grand Circuit,' and upon such payment all such obligations of this company will be discharged, and this company will be entitled to all the bonds and stock receivable by it upon full performance of said original contracts according to the terms, and, in addition, to like bonds for $2,055,000."

Metropolitan Street Railway.—The Central Park, North & East River, one of the New York horse-car lines, which was previously operated by the Metropolitan Street Railway, and the operation of which was discontinued by the federal receivers, has asked Judge Lacombe for an order directing Messrs. Joline and Robinson, receivers for the Metropolitan, to pay $96,750 rental for the road from January 1 to August 5. The company also asks that the receivers for the Metropolitan be ordered to restore the property and equipment taken over when the Metropolitan leased the Central Park, North & East River. Decision in the case has been reserved.

Municipal Traction Co.—The directors of this operating company of the Cleveland street railways have voted to trustee the stock in such a way as to secure the pledge made by Mayor Johnson and his associates that the company shall not be run for profit. (See General News Section.)

New Orleans, Fort Jackson & Grand Isle.—See New Orleans Southern.

New Orleans Southern.—This company has leased the New Orleans, Fort Jackson & Grand Isle, which runs from New Orleans, La., to Buras, 60 miles.

New York, New Haven & Hartford.—It is said that this company is planning to buy the outstanding securities of the United Traction & Electric Co., of Rhode Island, of which $8,000,000 is capital stock and $9,000,000 5 per cent. bonds. The New Haven is to buy also, it is said, $5,000,000 4 per cent bonds of the Rhode Island Suburban Railway. The United Traction & Electric and the Rhode Island Suburban own the electric lines in and around Providence, R. I., and Pawtucket. At present the New Haven operates these lines and pays 5 per cent. on the United Traction & Electric Co.'s stock.

Norfolk & Southern.—It is said that more than a majority of the first refunding mortgage 5 per cent. 50-year bonds have been deposited with the reorganization committee, and the time for deposit has been extended from October 1 to November 1.

Norfolk & Western.—At the annual meeting of the stockholders the directors were given authority to purchase the Lynchburg Belt Line & Connecting Railway, the Virginia Southwestern, the Pocahontas & Western, the Caretta and the Big Stony. All of these roads have been controlled and largely financed by the Norfolk & Western.

Rapid City & Wyoming Valley.—This company, with an authorized capital stock of $500,000, is, it is said, to take over the Missouri River & Northwestern, a line from Rapid City, S. Dak., to Mystic, 34 miles.

St. Louis, Brownsville & Mexico.—Albert T. Perkins, Managing Director, is quoted as denying that this road has passed to the ownership of any other railroad.

St. Louis & San Francisco.—Kuhn, Loeb & Co., New York, and Hallgarten & Co., Germany, have arranged to finance the $7,100,000 notes maturing December 1.

Second Avenue (New York).—The Guaranty Trust Co., New York, has brought foreclosure proceedings against the Second Avenue under the first consolidated mortgage securing an authorized issue of $7,000,000 bonds. (Oct. 2, p. 1,076.)

Southern Pacific.—Kuhn, Loeb & Co., Speyer & Co., and the National City Bank, all of New York, are offering $14,000,000 Southern Pacific first refunding mortgage 4 per cent. bonds due 1955, at 94½, yielding about 4.27 per cent. The notes are secured by a mortgage on 3,286 miles of main track, being all the railroad owned by the Southern Pacific in California, Arizona and New Mexico.

Southern Railway.—E. H. Gary, Chairman of the Executive Committee of the United States Steel Corporation, has been elected a Director of the Southern Railway, succeeding, as Director, Samuel Spencer, deceased.

Toledo & Ohio Central.—J. Landgraf, Auditor of the Toledo & Ohio Central and the Kanawha & Michigan, has been elected also director of the Toledo & Ohio Central, succeeding James M. Ferris, deceased. Chas. G. Hickox has been elected a director.

Wabash.—The directors and officers of the road were re-elected at the annual meeting held October 13.

Wisconsin Central.—The following new directors were elected at the annual meeting: Newman Erb, C. C. Dickinson, J. A. S. Graves and George J. Gould. They succeed M. T. Cox, J. F. Hill, G. A. W. Dodge and C. C. Rasmus.